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ADVERTISEMENT.

The plan and objects of the Medical and Chirurgical Society having been sufficiently explained in the Preface printed at the head of the First Volume of its Transactions, the President and Council, in laying this Second Volume before the Public, have but little to add to their former observations.

They cannot, however, refrain from congratulating the Medical Profession upon this speedy appearance of another set of Papers, which, they flatter themselves, will not in any respect be deemed unworthy of the Society; but, on the contrary, will be considered as a proof of its progressive improvement.

The effect produced by the First Volume has been evidently favourable to the advancement *of the Society. The number of its members has increased; its meetings have been better attended; and, above all, a more abundant supply of communications has been received. The library also has been gradually improving; a house has been obtained in a more central and suitable situation; and, in short, the Society has assumed a position which augurs most favourably for its permanent and increasing utility.*

Communications will continue to be received by the President or Secretaries, or through any other Member of the Society.

Medical and Chirurgical Society's House,
3, Lincoln's Inn Fields.

November, 1811.

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CONTENTS.

Page

I. A case of Aneurism by Anastomosis in the Orbit, cured by the Ligature of the common Carotid Artery. By Benjamin Travers, Esq. Demonstrator of Anatomy at Guy's Hospital, Surgeon to the Hon. East India Company, and to the London Infirmary for curing Diseases of the Eye. 1

II. A case of Hydrocephalus Internus. By Mr. William Cooke, Surgeon at Brentford. Communicated by Matthew Baillie, M.D. F.R.S. 17

III. On the Use of Oil of Turpentine in Tænia, communicated in a letter from John Ralph Fenwick, M.D. of Durham, to Matthew Baillie, M.D. F.R.S. . 24

IV. A case of Secondary Small Pox, with references to some cases of a similar nature. By T. Bateman, M.D. F.L.S. Physician to the Public Dispensary, and to the Fever Institution 31

V. A case of an Un-united Fracture of the Thigh, cured by sawing off the Ends of the Bone. By Griffith Rowlands, Esq. Member of the Royal College of Surgeons, London; Senior Surgeon to the General Infirmary, and Surgeon to the Lying-in Charity. Communicated by John Abernethy, Esq. . . 47

VI. A case of Malformation of the Head, constituting what

Page

is commonly called an acephalous fœtus By Mr. Burrows, Surgeon. Communicated by Dr. Yelloly. 52

VII. A case of Wound of the Heart. By J. Featherston, Esq. Communicated by Astley Cooper, Esq. . 58

VIII. History of an extraordinary Enlargement of the Right Lower Extremity; with a description of some morbid changes in the Papillæ of the Cutis. By Thomas Chevalier, Esq. F.L.S. Surgeon Extraordinary to the Prince Regent, and Surgeon to the Westminster General Dispensary 65

IX. An Account of a severe case of Erythema, unconnected with Mercurial Action. By Alexander Marcet, M.D. F.R.S. One of the Physicians to Guy's Hospital . 73

X. On Painful Affections of the Side from Tumid Spleen By Robert Bree, M.D. F.R.S. . . . 85

XI. A case of a Sailor, in the Muscles of whose Back the blade of a knife lodged above thirty years. Communicated in a letter from Mr. Francis Bush, Surgeon, at Frome, to Astley Cooper, Esq. F.R.S. . . 103

XII. A case of Fracture of the Occipital Bone, extending to the Great Foramen; in which that bone was trephined, and the Dura Mater of the Cerebellum punctured. By A. C. Hutchinson, M.D. Surgeon to the Royal Naval Hospital at Deal. Communicated by H. L. Thomas, Esq. 105

XIII. A case of premature Puberty in a Female, communicated in a letter from Martin Wall, M.D. F.R.S. Professor of Clinical Medicine in the University of Oxford, to Matthew Baillie, M.D. F.R.S. . 116

Page

XIV. Experiments on the Urine discharged in Diabetes Mellitus, with remarks on that disease. By William Henry, M.D. F.R.S. Physician to the Infirmary, Dispensary, and Lunatic Hospital at Manchester . 119

XV. A case of Recovery from the Effects of Arsenic; with remarks on a new mode of detecting the presence of this metal. By Peter M. Roget, M.D. Physician to the Northern Dispensary, and late Physician to the Infirmary, Dispensary, and Lunatic Hospital at Manchester 137

XVI. Experiments and Observations on the Serum of the Blood. By John Bostock, M.D. of Liverpool . 162

XVII. On the Mercurial Treatment of Dysentery, with observations on the same practice in Fevers. By William Fergusson, Esq. Inspector General of Hospitals to the Army in Portugal under Marshal Beresford. Communicated by Dr. Marcet, Foreign Secretary 181

XVIII. A case of Lithotomy, with remarks on the effect of that Operation; and on some cases of Fistula in Perineo. By Thomas Chevalier, Esq. F.L.S. Surgeon Extraordinary to the Prince Regent, and Surgeon to the Westminster General Dispensary. . . . 201

XIX. History of a singular Nervous or Paralytic Affection, attended with anomalous morbid sensations. Communicated by Dr. Marcet, Foreign Secretary . 217

XX. Account of a singular and fatal Disease occurring in several persons of the same hamlet. By Mr. Henry Gervis, Surgeon at Ashburton. Communicated by Dr. Curry . 236

Page

XXI. Case of Dysphagia produced by Aneurism of the Aorta. By T. J. Armiger, Esq. Surgeon Extraordinary to His Royal Highness the Duke of Kent, and one of the Surgeons of the Eastern Dispensary . 244

XXII. Dissection of a Limb on which the Operation for Popliteal Aneurism had been performed. By Astley Cooper, Esq. F.R.S. Surgeon to Guy's Hospital . 251

XXIII. A case of Hydatid in the Brain. By Mr. Michael Morrah, Surgeon at Worthing. Communicated by Dr. Yelloly 262

XXIV. Case of Amputation at the Shoulder Joint; drawn up by John Henry Cutting, M.D. Communicated by Dr. Marcet, Foreign Secretary . . . 266

XXV. A case of Trismus following a contused wound in the Head. By J. Harkness, Esq. Surgeon of Ratcliffe 286

XXVI. A case of Trismus successfully treated. By John Parkinson, Esq. Surgeon. Communicated by James Parkinson, Esq 293

XXVII. Observations on Tumors within the Pelvis, occasioning difficult Parturition. By H. Park, Esq. Surgeon at Liverpool. Communicated by Dr. Yelloly. 298

XXVIII. Case of Fractured Cranium, when the Dura and Pia Mater were lacerated, and a great quantity of Cerebrum protruded, which terminated favourably. By P. T. Creagh, Esq. Surgeon of the Royal Navy. Communicated by H. L. Thomas, Esq. . . 309

XXIX. Some Observations on Spina Bifida. By Astley Cooper, Esq. F.R.S. Surgeon to Guy's Hospital . 324

Page

XXX. A Chemical Account of Various Dropsical Fluids; with remarks concerning the nature of the Alkaline Matter contained in these Fluids, and in the Serum of the Blood. By Alexander Marcet, M.D. F.R.S. One of the Physicians to Guy's Hospital . . 342

XXXI. Case of a Woman who voided a large number of Worms by the Urethra; with a description of the Animals. By W. Lawrence, Esq. Assistant Surgeon and Demonstrator of Anatomy at St. Bartholomew's Hospital 385

XXXII. Some Account of the Effects of Arsenic in counteracting the Poison of Serpents. Communicated in a letter from Mr J. P. Ireland, Surgeon to the Fourth Battalion of the 60th Regiment of Foot, to Thomas Chevalier, Esq. 396

List of Donations to the Society . . . 405
Explanation of the Plates 408
Index to the first and second Volumes . . 410

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A CASE

OF

ANEURISM BY ANASTOMOSIS IN THE ORBIT,

CURED BY

THE LIGATURE OF THE COMMON CAROTID ARTERY.

BY BENJAMIN TRAVERS, ESQ.

DEMONSTRATOR OF ANATOMY AT GUY'S HOSPITAL, SURGEON TO THE HON. EAST INDIA COMPANY, AND TO THE LONDON INFIRMARY FOR CURING DISEASES OF THE EYE.

Read November 1, 1809.

FRANCES STOFFELL, aged 34, a healthy active woman, of fair complexion, middle stature, and the mother of five children, on the evening of the 28th of December, 1804, being some months advanced in pregnancy, felt a sudden snap on the left side of her forehead, which was attended with pain, and followed by a copious effusion of a limpid fluid into the cellular substance of the eyelids on the same side. For some days preceding she had complained of a severe pain in the head, which was now increased to so great a degree, that for the space of a week she was unable to raise it from the pillow. The œdematous swelling surrounding the orbit was reduced by punctures; an issue was set in the temple for a smart attack of ophthalmia which supervened; and leeches and cold washes were applied. She now first perceived a protrusion of the globe of the eye which affected the sight, and a circumscribed tumour, elastic to the touch, about as large as a hazel nut, appeared upon the infra-orbitary ridge. Another softer and more diffused swelling arose, at the same time, above the tendon of the orbicularis palpebrarum. The lower tumour communicated both to the sight and the touch, the pulse of the larger arteries; the upper gave the sensation of a strong vibratory thrill. The swellings grew slowly, and the skin between the eyes and that of the lower eyelid became puffed and thickened. The globe of the eye was gradually forced upwards and outwards, and its motions were considerably impeded. She had a constant noise in her head, which, to her sensation, exactly resembled the blowing of a pair of bellows. The pulsatory motion of the tumours was much increased by agitation of mind, or strong exercise of body. But the most distressing of her symptoms was a cold obtuse pain in the crown of the head, occasionally shooting across the forehead and temples. She was compelled to rest the left side of her head on her hand when in the recumbent posture, and found the beating and noise to increase sensibly when her head was low and unsupported.

Such was the substance of the patient's report when I was requested to see her by my friend Dr. Cholmeley, Assistant Physician to Guy's Hospital. Her physiognomy was hard and coarse, and the skin in the region of the orbits appeared morbidly thick and wrinkled. The eyebrow of the diseased side was straitened, and driven from two to three lines above the level of the opposite eyebrow. The hollow of the orbit was lost, the superior lid rising convex from the superciliary ridge, owing to the strained elevation of the globe of the eye. The upper half of the inner canthus was filled by the thrilling tumour, which presented a loose woolly feel, was very compressible, and when firmly compressed, offered a slight pulsation. The veins of the superior lid were varicose from distension; the skin was much pursed over the lachrymal sac, and the veins on the sides of the nose turgid. The lower tumour, which projected above the suborbitar hole, was of a conical shape, and firmly elastic to the touch. The under lid was raised as far as to the outer angle of the orbit, above the apex of the cheek. This lower tumour could be emptied or pressed back into the orbit, but the pulsation then became violent; and from the increased pressure of the globe upon the roof and side of the orbit, the pain was insupportable. Careful compression of the temporal, angular, and maxillary arteries produced no effect on the aneurism. Upon applying my thumb to the trunk of the common carotid, I found the pulsation cease altogether, and the whiz of the little swelling was rendered so exceedingly faint, that it was difficult to determine whether it continued or not. The recent increase of puffiness in the skin over the root of the nose, and below the inner angle of the opposite eye, had given alarm to the patient and her friends, who feared, not without some appearance of reason, a similar affection of the right orbit.

When I first saw the disease, I felt persuaded that it could be no other than that described by Mr. John Bell, under the term '*Aneurism by Anastomosis.*' Indeed it bore so strong a resemblance in its principal features, to several of Mr. Bell's cases, and in particular to that communicated by Mr. Freer of Birmingham, whose patient refusing assistance expired of hæmorrhage, that I considered the sensible growth of the disease an argument of sufficient force to justify any rational effort at its restriction. From the character of similar cases, and the idea which I had formed of this, it was to be expected, that, although it had been slow in its formation, it would be rapid in its increase; and unlike the aneurism of trunks, would resist controul as it acquired size. I first tried the effect of pressure on the swelling, but, although moderate, it could be borne only for a very limited time, by reason of the pain attending the exasperated action of the arteries. Cold applications had been already made use of without any evident advantage, but indeed the duration and aspect of the disease made this remedy appear trifling. Excision, the only method of which in similar cases experience had confirmed the success, was clearly impracticable without extirpation of the eye; and from the great displacement of the globe, and the obvious origin of the disease within the orbit, I considered the result of such an operation to be most precarious. Being satisfied of the growth of the disease; knowing from a late happy precedent the perfect practicability *, and under favourable circumstances the moderate risk of placing a ligature on the carotid artery; and particularly reflecting that the obstruction of such a channel, must, at all events, be followed by a sensible and permanent diminution of the impulse of blood destined to the disease, I proceeded to the operation on Tuesday the 23d of May, 1809, in presence of Dr. Cholmeley, Mr. Geo. Young, Mr. Brickenden, and other gentlemen.

The patient was laid supine; the neck raised by a pillow, the chin slightly turned to the left shoulder. An incision, about two inches and a half in length, was commenced at the distance of one inch above the sternal extremity of the clavicle, and carried in an oblique direction along the anterior edge of the mastoid muscle. The fibres of the muscle being exposed, its edge was

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[*] See a case of Carotid Aneurism, &c. by Astley Cooper, Esq. Medico-Chirurg. Trans. Vol. I.

raised, and the sheath of the vessels cautiously cut open on the tracheal side. Through this opening, which was of very small extent, a curved eyed probe, carrying a stout round ligature, was passed beneath the artery *, care being taken to exclude the nerve. The probe being cut away, the ligatures were drawn apart from each other, the lower being tied at the lowermost point of the denudation of the artery, the upper at the highest. They were about one fourth of an inch distant; and whilst they were tightened, the division of the internal coat of the vessel could be distinctly felt. The lips of the wound were lightly brought together by adhesive straps, and the ligatures drawn out opposite to the point of their application on the artery.

The patient, before she quitted the table, observed, that the pain was numbed, and that the noise in her head had entirely ceased. The small tumour over the angle of the eye was still thrilling, but very obscurely. Two hours after removal to her bed, I found her free from pain, but uneasy from having preserved the same posture. She was fatigued, and anxious to procure sleep.

Eight o'clock, P. M.—Patient has been distressed with nausea; dozed frequently, but was as frequently disturbed by nervous startings, and ramblings about her husband and children; complains of severe pain darting from temple to temple, and soreness of her back and loins; pulse 90, and rather hard; skin cool, slight thirst. The lower tumour, I was concerned to find, had already acquired the thrilling motion of the upper. She was ordered the saline effervescing draught every third hour.

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* The pulsation of the lower tumour immediately ceased upon compressing the vessel with the finger as it lay over the probe.

Second day, eight o'clock, A. M.—Restless all night, and continually changing posture. From two to four o'clock particularly uneasy: she even attempted to get up and dress herself; appears now pretty comfortable, having had a short refreshing sleep. Pain in the back very severe; that in the head confined to the forehead, and somewhat abated in violence; pulse 124 and hard; tongue lightly furred; some thirst.

Two o'clock, P. M.—Restlessness and other symptoms continue; pulse 132.

Eight o'clock, P. M.—Says she is much better; free from pain in the head, and has less in the loins; pulse as before; tongue moist; skin cool; has enjoyed some short but refreshing sleep; complains of stiffness in the throat and neck; mind tranquil.

Third day, ten o'clock, A. M.—Has passed a pretty quiet night; slept soundly at intervals; pain in her back has ceased. Much agitated by the firing of the Tower guns, and has since had a very severe pain in the top and back of the head; pulse 112, fuller, and sensibly softer. The tingling or thrilling sensation is experienced in both tumours upon light contact of the finger; if firmly compressed, a pulse may be perceived in the lower.

Ten o'clock, P.M.—An enema has been administered without effect; has been troubled with colicky pain in the abdomen, and having had no evacuation, was ordered a purgative saline draught.

Fourth day, nine o'clock, A.M.—No sleep till three o'clock, owing to the pain in her head; pain now less severe. Had a copious evacuation from the bowels at seven o'clock, and the catamenia as expected.

Four o'clock, P.M.—Complains of heavy pain in the occiput; no other symptom of commotion in the system; pulse 92 and soft; sits half erect; has eaten some light pudding with appetite.

Fifth day, ten o'clock, A.M.—Has passed an uneasy night from continued pain in the top and back of the head. She complains that though the pain is deeper seated, it renders the scalp tender. The tumours are very considerably diminished, and the eye less prominent. When she first sat up, her head was so light that she was immediately compelled to resume the recumbent position. She still experiences so much of the same feeling as to require support. I observed that the globe of the eye communicated a slight pulsation. Her sight is short, and objects appear to her larger than natural and misty*.

Four o'clock, P. M.—Is comfortable in every respect, having slept for some hours together; pain in the head has ceased; pulse 84 and natural. Can preserve the sitting posture longer without support.

Sixth day, noon.—Ate a mackarel with appetite for dinner; continues free from pain. On removing the dressings, pus flowed out profusely by the side of the ligatures. Above and below them the wound has united by the first intention. Granulations and discharge healthy.

Seventh day, noon.—Slept perfectly undisturbed all night; was slightly affected to-day by the ringing of bells, and finds any continued noise painful. I allowed her to eat meat. The thrill of the lower tumour is not perceived when the upper is compressed; but it has besides a feeble, though distinct pulsation.

Eighth and ninth days.—Going on well in all respects. Granulations and discharge healthy.

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* In the misty vision preceding blindness from idiopathic affection of the retina, objects appear for the most part smaller than natural.

First of June, tenth day.—Has had a bad night and much restlessness, owing to a return of the pain in her head, which lasted for three hours, and left the integuments sore. Has been up, and finds she can walk better than she expected. The wound would heal immediately but for the ligatures; they are fast rising towards the surface, but are not yet loose.

Twelfth day.—Makes no complaint; sits up and works in her bed without fatigue; eats and sleeps well.

Fourteenth day.—Still has occasional pain in the summit and back of the head; but it is more tolerable than before the operation.

Seventeenth day.—Sat up to her tea last night, and sits in a room adjoining her chamber this morning; feels weak; fears her eye is more displaced; thinks the brow is pushed higher, and the lower tumour larger. Her husband and friends have expressed the same opinion. The ligatures continue to loosen daily. The left side of the neck is stiffened from the ear to the shoulder, which prevents the free motion of the head. The fibres of the platysma myoides feel rigid and corded, from the inflammation which the wound has excited. She has had shooting pains in the eye since the last report, but they subsided on leaving off a green silk shade, which she remembers to have produced the same effect before the operation.

Twenty-first day.—The upper ligature came away without force. The patient finds no inconvenience from sitting up and working all day. She was astonished to find that she could read small print and do fine work with her right (i. e. sound) eye, which she has been unable to do for years. The stiffness of the left side of the neck is decreased. She has been pressing, some days past, for permission to walk out.

Twenty-second day.—The lower ligature had come away spontaneously, and was found in the dressings. From it hung the slough of the artery included between the threads.

From this day she was permitted to go out. On the twenty-third she walked two miles, by which, as might have been foreseen, she was greatly exhausted. On the twenty-ninth she returned to her family. The wound quickly healed. At the end of the fifth week she could perform all the duties of her situation as well as before the operation. She expressed herself well satisfied with the obvious diminution of the tumour, the decrease of the pulsation, and the total freedom she enjoyed from pain, which had distracted her for years.

20th September.—It is now four months since the operation was done. The tumours are evidently smaller, and their motion materially diminished. The eye is likewise less projecting. The cold dull pain, though formerly uninterrupted, is now but rarely felt. The artery of the left side may be distinguished very feebly beating below the angle of the jaw. The carotid of the opposite side contracts with more than ordinary force. Mr. Brickenden, who has watched the disease from its commencement, and had observed its more than usual progress before the operation, considers it to have received a decided check from that period. The husband and friends of the patient, as well as herself, are of the same opinion. She suffers occasionally from irregular digestion, to which she has been long subject; but in other respects is as well, and endures as much labour with as little fatigue as formerly.

On Saturday, 28th of October, she miscarried at the period of about ten weeks from conception. The hæmorrhage was so considerable as to induce syncope, and leave her in a state of extreme debility. On the succeeding morning it was observed that the upper tumour was flattened, and the pulsation had altogether ceased. On the Monday ensuing she felt pain in the affected side of the head, and was feverish. In the course of a few hours the cellular substance in the region of the orbit was filled with a serous fluid precisely similar to that experienced in the commencement of the disease; the pain was abated, and the œdematous swelling and heat of the surface reduced by a cold lotion. She has now (November) no pain in her head; but owing to her extreme debility from loss of blood, is subject to occasional palpitation of the heart and giddiness. The upper tumour and the gathers of integument between the eyebrows have totally disappeared. The eye projects less; the lower tumour is inelastic, and has no preternatural pulsation.

During the Christmas following she was afflicted by the loss of a child, before she had recovered the debility which her miscarriage had induced. She was then seized with faintings, accompanied with a loss of sense and motion, frequent retchings, and discharges of blood by the bowels. For nearly two months she was confined to her bed, and still remained in a state of lowness, from which her apothecary and friends had no expectation of her recovery. In June following she went by my advice to visit some friends in the country, thirty miles distant from London, and remained there for two months. She returned in health, which she has ever since enjoyed uninterruptedly in a higher degree than for many years past.

May, 1811.—Mrs. Stoffell is looking florid and healthy. Of the disease, a knob of the size of a large pea over the inner angle of the eye is the only vestige that remains; she is still occasionally subject to pain in her stomach, and other symptoms of dyspepsia, a complaint with which she has been troubled for the last fifteen years.

The annexed plate conveys a tolerably accurate idea of the disease, and of the effect of the operation.

Having never seen a parallel case to that which I have related, I am unable to add information on the nature of this rare but formidable species of tumour.

I have thought the case worthy of detail on two accounts; first, because it furnishes a second conclusive example of the safety of an operation, which has been commonly regarded as impracticable or injurious to the functions of the sensorium; secondly, because it determines the influence which, by the ligature of the carotid trunk, we possess over the diseased condition of its branches. It appears that, like every other trunk of the arterial system, the carotid may be obstructed without injury to the organ which it supplies; or, in other words, that the collaterals will convey a quantity of blood sufficient for its nourishment and functions.

The circulus arteriosus formed by the communion of the basilar and carotid arteries at the basis of the brain, seems to be the resource which nature has provided for the preservation of the cerebral circulation under this emergency.

It has been supposed that by the obstruction of one of the carotid arteries, the volume of blood supplying the brain was permanently diminished. The reason for this opinion was suggested by the passage of the carotids and vertebrals through bony canals, which would prevent an augmentation of their capacity. It might be further supposed that the intention of nature in this peculiarity of structure was to prevent the deleterious effect of the pressure which would result from dilatation of the vessels in an organ so delicate. But can it be imagined that the functions of such an organ should be unaffected by the permanent privation of one fourth part of its circulating blood? Besides, if the volume of blood be not increased by diversion into other channels, how should the pressure be increased? The mere change of place could be of no importance, because at whatever point pressure was applied, it would be equally diffused over the mass, as is proved by the symptoms following the depression of a portion of fractured bone of the diameter of a shilling.

Nor can the fact of diminished volume be determined from the inclosure of the carotid and vertebral arteries in bony canals, but let it be granted; the unobstructed carotid acts with in-

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creased force, and the increase of but a few beats in frequency would amply compensate for the loss of volume.

But it is superfluous to look beyond the obvious visible effect. The disease appeared essentially to consist in a preternatural impulse of the blood conveyed to the part. By obstructing the direct channel this impulse was broken, the circulation became anastomotic, the blood which was before influent, was now refluent; the part was supplied at second-hand, instead of directly from the heart. Is not this the *modus operandi* of the ligature in the cure of all Aneurisms?

A CASE

OF

HYDROCEPHALUS INTERNUS.

BY MR. WILLIAM COOKE,

SURGEON, AT BRENTFORD.

COMMUNICATED

BY MATTHEW BAILLIE, M.D. F.R.S.

Read Nov. 21, 1809.

I HAVE ventured to submit to the consideration of the Medical and Chirurgical Society, the history of the following case of Hydrocephalus, which was combined with an extensive scrophulous affection of the liver, and of the left kidney, and a premature developement of the external pudenda.

Louisa Flux was born in the parish of Isleworth, in 1802, without any apparent peculiarity of structure, and continued in tolerably good health, except that she was remarkably thin, and was disposed to obstinate costiveness, till she reached her fourth year.

At this period it was accidentally observed by the woman who had the care of her, and from whom I received the particulars, that the external pudenda had become prominent, and were covered with a quantity of dark hair.

She enjoyed her usual state of health till within four months of her death, when she was suddenly attacked with an acute pain over the right hypochondrium, succeeded, in the course of the day, by violent vomiting and purging, and fell down in a strong convulsion, which lasted ten minutes, and was followed by two others of the same duration. In the afternoon, Mr. Day, a medical gentleman at Isleworth, saw her, and, as there was no recurrence of the convulsions, he considered the complaint as Cholera morbus, and pronounced her convalescent about the thirteenth day.

Shortly after this attack, she became extremely fat, complaining occasionally of a pain in her right side, and over the same temple. The expression of her countenance was altered. From a pale child, she became excessively and permanently florid. Her cheeks were downy, and her upper lip was covered with so much hair, that it might be said she had a beard. Her voice, which had formerly been shrill, was now more strong, and her whole contour was that of puberty, with the exception of the breasts and the general stature.

About the middle of July, 1809, and within ten weeks of her death, she was seized with shortness of breath, accompanied with an erysipelatous inflammation on the left shoulder, which extended partly over the breast, and was extremely painful. On the third day, the surface of the inflamed skin was covered with large vesicles, which, with the affection of the breath, continued a fortnight, after which period they subsided.

As she rapidly enlarged, her friends consulted Mr. Dundas of Richmond, who saw her on the ninth of August, and ordered her to take digitalis three times a day, and calomel and squills occasionally. She was, however, not only not reduced in size from this course of medicine, but her obesity visibly increased.

On Saturday the 30th of September, after complaining of giddiness, pain in the head, and dimness of sight, she was observed to squint, and instantly fell into strong convulsions, which occasionally recurred with increased violence till the following morning, when she died, not having reached the seventh year of her life.

Mr. Stenson and Mr. Beddome saw her on the Saturday, and remarked the strong strabismus with permanent dilatation of the pupils.

The body was opened the following morning by Mr. Stenson, in the presence of Mr. Day, Mr. Beddome, and myself, and the following particulars were remarked:

DISSECTION.

On raising the scull, the dura mater was found adhering to it more firmly than usual. The veins of the pia mater were loaded with blood. The membrane itself was puffed up with water, which freely escaped on puncturing it. The substance of the brain was soft. The ventricles were much enlarged, and contained water, particularly the right ventricle, which held nearly two ounces of clear lymph.

The thoracic viscera had undergone no morbid change. The right cavity of the thorax was much diminished by the pressure of the right lobe of the liver, which had forced up the diaphragm into the form of an irregular arch, allowing very little space for the action of the lung on that side. The upper surface of this muscle was inflamed; its veins very turgid, and ulceration was about to take place. A quarter of a pint of bloody serum was floating in this cavity.

On drawing aside the parietes of the abdomen, the portion of the liver that presented itself had a healthy appearance, and was found on examination not to have suffered any alteration in its structure, with the exception of that part which immediately surrounded the abscess hereafter mentioned, and which was of a deep purple colour, and studded with a few small tubercles.

This viscus occupied an unusually large extent of the abdomen, and stretched its edges over the great arch of the colon. On raising the right lobe, the gall-bladder was seen much distended with bile, resting upon a large irregular tumour, which extended itself from the superior edge of the concave side of the liver, obliquely to the left kidney, with which it was intimately blended; forming adhesions to the right kidney as it passed, and occupying nearly the whole of the hypochondriac region. Not being able to disentangle these viscera, we resolved to remove them *en masse*, in which we succeeded. On cutting into the tumour, a quantity of thick chocolate-coloured matter was pressed out, which brought into view an irregular abscess studded with large white tubercles, resembling scrophulous absorbent glands. Tracing the cavity of this abscess downwards, it was found communicating with the pelvis of the left kidney, which had undergone the same morbid change, putting on a tuberculated appearance, and containing a calculous concretion. The right kidney was free from disease, but had its tubuli uriniferi very strongly marked.

The other abdominal viscera were healthy.

No change had taken place in the internal organs of generation, the ovaria and uterus not having received that increase of size which is usual at puberty.

The mons Veneris, and labia pudendi, were as prominent as at perfect puberty, and covered with long, black, curling hairs.

The clitoris, on separating the labia, appeared, when raised, to be nearly an inch in length, with its glans clearly defined, and resembled a penis.

Menstruation had not taken place.

This makes the fourth case of Hydrocephalus internus, which I have examined with Mr. Stenson during the last twelve months, all of which were accompanied with affections of the liver. Three of them occurred in children under twelve years of age. In one, the mesenteric glands were so much enlarged, as to be apparent to the touch during life; and a scrophulous tubercle was found imbedded in the cerebellum, the size of a nutmeg. The other case was in an adult, who died maniacal, and was attended by Dr. Willis.

How far a scrophulous state of the liver and mesenteric glands may be the precursor of water in the ventricles of the brain, I leave the pathologist to determine; but it is evident, from the cases which I have mentioned, that these diseases were closely connected.

New Brentford,
Oct. 7, 1809.

ON THE USE OF

OIL OF TURPENTINE IN TÆNIA.

COMMUNICATED

IN A LETTER FROM

JOHN RALPH FENWICK, M.D. OF DURHAM,

TO

MATTHEW BAILLIE, M.D. F.R.S.

Read January 2, 1810.

Durham, December 19, 1809.

SIR,

HAVING been informed that you are desirous of a fuller account of the efficacy of the Oleum Terebinthinæ in expelling the tape-worm, and knowing no one, who, by his influence in the medical world, and his zeal for the improvement of medicine, is more likely to diffuse a knowledge of that remedy, I shall now lay before you a detail of all the information I have received, and of all that my own experience has taught me on the subject. You will make what use you please of the communication, as my only wish is to make the remedy generally known, In the month of August last, I was told that Mr. John Hall, of this city, had been cured of the tape-worm by the use of Oleum Terebinthinæ, and had since administered it with success in several other cases; and lost no time to procure a conference with him, when I received the following information.

He stated that about five years ago, when suffering severely from the tape-worm, he had met with a seafaring man, who said he had cured himself of the complaint by taking Oleum Terebinthinæ. He was induced (as he informed Mr. Hall) to try it, by observing that whenever he drank rather freely of gin, he always passed portions of the worm, and experienced relief; which led him to hope, that if he could find some substance of the same nature as gin, but stronger, it might effectually cure him. Under this impression, he took (his ship being at that time in the Baltic) a wine glass full of Oleum Terebinthinæ. The consequence was, that about two hours afterwards he passed, with a purgative stool, an entire tape-worm; from which time the complaint had not returned. Disappointed in all the remedies employed in regular practices, and encouraged by this statement, Mr. Hall took two or three ounces (for he was not at the trouble to measure it), of undiluted Oil of Turpentine in the morning fasting; and as it did not operate in two hours, he had recourse to a second dose, amounting, as near as he could guess, to $\frac{3}{4}$ of the first. In about an hour after, he had a purgative stool, and with it passed a tape-worm apparently not quite dead. The medicine produced giddiness, like that which follows the use of ardent spirits, a slight headach, and a tendency to sickness, but he felt no other inconvenience, and he has since continued well. Though I had no reason from Mr. Hall's character, to doubt the truth of his account, yet the extraordinary dose, in which the medicine was said to have been taken, determined me, before I ventured to employ it, to examine carefully, and apart, those inhabitants of this city, to whom he told me it had been successfully administered. As their account entirely confirmed his, I shall now give the outline of their cases.

1. —— Greathead, aged 70, had been afflicted with the tape-worm above twenty years, during which time he had taken many remedies; and among others Madame Nuffer's, with temporary relief, but with no permanent advantage. He took Olei Terebinthinæ ℥ii. undiluted, fasting; and in two hours after ℥i. more. A tape-worm came away soon after in a dead state, and he has since experienced no return. This took place near three years ago. The medicine acted as a brisk purgative, and produced considerable sickness, but no other inconvenience.

2. Edward Dodd, Serjeant-major to the Durham

Volunteers, also took the Oleum Terebinthinæ rather more than two years ago. He had had the disease about fifteen years, and had tried Madame Nuffer's and other remedies in vain. In this case also, a second dose of ℥i. was given two hours after the first, as that did not affect the bowels. This, in less than an hour, was followed by the expulsion of a dead tape-worm, 15 feet long, which he had preserved and shewed me. He has had no return. Edward Dodd informed me, that he gave it to a young girl of 10 years of age, in the dose of ℥i. with complete success.

3. Robson, shoemaker, aged 45, took the Oleum Terebinthinæ two years ago after breakfast with considerable relief; but his complaint returning in about six weeks, he next took it in the usual dose, and fasting. He did not attend to the nature of what passed, except so far as to observe that there were numerous portions of worm; but he has since been free from all complaint. This patient having drunk some malt liquor in the evening before the action of the medicine had ceased, was seized with such violent vomiting and diarrhœa as greatly alarmed his family. He did not remark that the liquor was hard, stale, or otherwise bad in its quality.

Besides these, five other cases were mentioned to me by Mr. Hall; but as I had not an opportunity to examine the patients, I do not notice them here.

Conceiving myself now fully justified in trying the remedy, I recommended it to Francis Coward of this city, butcher. He had laboured under the disease for several years, and was much emaciated. The medicine was administered by Mr. Clifton, surgeon, on the morning of August 8th. The first dose of ℥ii. not affecting the bowels, in two hours ℥i. more was given, and in about half an hour after, an entire tape-worm, measuring 14½ feet, came away dead. Soon after taking the first dose, when I saw him, he complained of giddiness and tendency to sickness. Neither his pulse nor the heat of his skin were affected by it. It operated briskly after the second dose, and produced great sickness in the evening; but he had no strangury or heat in passing urine, or other inconvenience, and was cheerful and at work early the next day. Dr. Southey saw this patient as well as Mr. Clifton and myself. Within the last three weeks the disease has returned, and he will shortly again take the remedy.

The second patient to whom I recommended the Oleum Terebinthinæ, was Anne Lumsden, aged 20. She took Olei Terebinthinæ ℥ii. undiluted on the 23d of August, and that dose not operating in two hours, she had ℥i. more. Near another hour passed before she had a motion, and the first being scanty and nearly natural, and without any portion of worm, she took a third dose of the same strength as the second. The medicine then operated briskly, bringing away a large quantity of worms broken into small portions, with what had the appearance of skins and much mucus. I saw her on the 13th instant, and she had not since felt any symptom of the disease. This patient was seen by Mr. Clifton also.

The third case was that of Welford, shoemaker, aged 19. He had before twice taken the Oleum Terebinthinæ. After the first trial, he remained free from all complaint for near six months; after the second not quite so long; with both a great quantity of worm had been passed. He took the medicine August 25th, and passed several portions of worm, the operation of the Oleum Terebinthinæ being that of a severe purgative, and producing considerable sickness; but as he felt quite well the next day, and the effect had not been quite satisfactory, I advised Mr. Clifton again to give it to him on the 27th of August. He accordingly did so; with this dose however no tape-worm passed, but only a very large dead Lumbricus. During the month of November, he again had evidence of the presence of a tape-worm, upon which he had once more recourse to the Oleum Terebinthinæ, which brought away an entire tape-worm, which was dead when it passed. I saw it in Mr. Clifton's possession. I shall now offer a few observations.

From the general failure of purgative medicines in this disease, and from the circumstance of all the worms being dead when they passed (except *perhaps* in Mr. Hall's case) we may safely conclude, that besides its purgative quality, the Oleum Terebinthinæ is really poisonous to the Tænia. But although destructive to the worms present, we have evidence in the cases of Welford and Coward, that it does not remove the tendency to generate those animals. This is yet a desideratum. From Welford's case there seems reason to hope, that Oleum Terebinthinæ will be found useful against the Lumbricus, and I am disposed to try it, in the form of injection, against Ascarides also.

After the evidence adduced, it is unnecessary to dwell upon the safety of these large doses of Oleum Terebinthinæ; I will therefore only observe that, when exhibited, its quick action on the bowels prevents its absorption, and accordingly we find in these cases, no complaint of those affections of the urinary passages, which have arisen from much smaller doses. As to the mode of exhibition, my directions have been, to take either no supper, or a very light one the night before; to abstain from all food or liquid till the medicine has operated twice or thrice, or a worm has passed; then to dilute freely, and through the day to avoid spirituous or fermented liquors.

I have the honour to be

Your obedient servant,

J. R. FENWICK.

A CASE

OF

SECONDARY SMALL-POX,

WITH

REFERENCES TO SOME CASES OF A SIMILAR NATURE.

By T. BATEMAN, M.D. F.L.S.

PHYSICIAN TO THE PUBLIC DISPENSARY, AND TO THE FEVER INSTITUTION.

Read Jan. 30, 1810.

IT has long been observed by medical practitioners, that, after the constitution has undergone the ordinary influence of small-pox, the individual is still liable to be *locally* affected by the variolous poison, whether introduced under the cuticle by inoculation, or applied in continued contact to the undivided skin. Hence, on the one hand, some inoculators have been in the practice of repeatedly inoculating themselves, and raising a pustule on some part of their own skin, in order to preserve a constant supply of the *virus* for the purposes of their profession; and, on the other, no phenomenon is more common than an eruption of variolous pustules round the nipples and on the breasts of women, during an attack of small-pox in the infants whom they suckle. In some cases, a moderate degree of feverishness and general indisposition is observed to accompany these secondary eruptions. It is, however, almost universally believed, that the constitutional effects of the variolous poison having been once produced, nothing beyond this local influence can result from its application hereafter. But many exceptions to this general truth are recorded, upon undeniable evidence, and might be multiplied, it is probable, were all cases of the kind accurately noted, and none of a questionable nature slurred over or explained away, under the presumption of the impossibility of a second occurrence of small-pox. Two instances of this recurrence of the disease have come under our notice, at the Public Dispensary, within the last three years, although small-pox rarely claims the attention of physicians in those institutions, unless in a few severe and aggravated cases. The instance, which I have now to relate, is of recent occurrence.

Frances Bird, aged 25, residing at No. 3, Bowl and Pin Alley, Chancery Lane, nursed with great assiduity an infant, nine months old, during the progress of confluent small-pox, of which it died on the 15th day of November, 1809. For two or three days previous to the death of the infant, she felt herself languid and feverish; and on the evening of the 15th she became still more indisposed, complaining of considerable pain in the back, pains about the breast and stomach, thirst, and loss of appetite, which were followed by vomiting. These febrile symptoms continued; and on the 17th an eruption began to appear on the skin*. On Tuesday, the 21st of November (the 5th day of the eruption) she called upon me at home, supported by her mother, and stated the extreme indisposition, under which she laboured, as an apology for not deferring her application until the following day, at the regular hour of attendance at the Dispensary. Her countenance was exceedingly heavy and languid; the eyes were dull, and slightly suffused with redness; the tongue was furred, white, and rather clammy; the pulse frequent and feeble; and the skin hot and dry, with a sensation of soreness and stiffness in it. She complained of great inability of exertion, and of much general uneasiness. There were about fifteen spots on the face, approaching to the pustular character, some of them rather horny and tuberculated, but others less so, and surrounded by a slightly red circle; two or three of them, indeed, on the left cheek, were surrounded by considerable redness and some hardness and elevation of the skin: there were three or four on the eyelids, accompanied by some redness of the tarsi, especially of the right eye, and two on the side of the nose: there were also several other pustules on the breast, and, as she stated, on the body and thighs to the number of about fifty.

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* This circumstance is worthy of particular observation. In those instances of the recurrence of small-pox in a local degree which are common in nurses, the feverishness, if any take place, appears *subsequent* to the eruption, of which it is symptomatic; but, in this case, the fever *preceded* the eruption, as in the ordinary progress of the Exanthemata.

This eruption was obviously of a variolous character, and had been so considered by her mother and friends. But the mother expressed her surprise at the occurrence, since she affirmed that the patient had undergone the casual small-pox in her infancy, in so severe a degree that her life was then despaired of;—that the medical attendant had called it "the *putrid* small-pox;"—and that she had been blind six days: all of which was corroborated by the *numerous pits* with which her face was thickly marked.

At my request, Dr. Willan saw her this day, and confirmed the opinion of the variolous nature of the eruption: he obtained a drawing of the pustules, as they appeared on the face, which he has kindly allowed me to lay before the Society.

Wednesday, *Nov.* 22. (6th day.)—I visited her, in company with my friend and colleague, Dr. Laird. We found the pustules somewhat increased in elevation, and the redness surrounding them also augmented. The countenance was still dull and heavy, and the eyes rather suffused. The pulse 110; the tongue white, and rather dry; the skin slightly hot; no appetite; some thirst. A laxative, prescribed yesterday, had operated. There were several pustules on the left mamma, four or five immediately surrounding the nipple, the child having been nourished from that breast.

Thursday, Nov. 23. (7th day.)—Doctors Laird and Birkbeck visited her with me to-day. The elevation of the pustules is nearly as yesterday; the surrounding redness is almost gone: those about the nipple are beginning to dry. She still complains of being feverish, and without appetite for food; but there is less heaviness, and no redness of the eyes, and much less languor of the countenance. The tongue is still white, but moist: the pulse still quick. On the suggestion of Dr. Birkbeck, one of the pustules was opened, and the fluid found to be purulent. Bowels much relaxed by the diaphoretic mixture, which she has taken.

Friday, Nov. 24. (8th day.)—She walked to Dr. Willan's house in Bloomsbury Square, this morning, found herself ill and fatigued after her return, and was lying on the bed when I called upon her. She complained of languor and headach; the pulse was upwards of 100; and the skin rather hot; the tongue as yesterday. The pustules on the face are full, and of a deeper yellow colour; those on the eyelids somewhat sunk and horny. I armed a lancet from one of those on the cheek.

Saturday, Nov. 25. (9th day.)—She is free from indisposition, and the pustules generally are drying, and of a brown colour:—those on the cheek, which were surrounded by the largest areolæ, still contain pus; and one on the neck, and another on the thigh, are large, elevated, and inflamed, assuming the appearance of small boils, and containing a considerable quantity of purulent matter.

Monday, Nov. 27. (11th day.)—All the pustules are dried, and a little, acuminated, brown scab is formed upon each of them.

With the lancet, which was charged with *virus* on the eighth day of the eruption, the arm of a young woman was inoculated by Mr. Wachsel, in the Small-pox Hospital; while *virus*, taken from a patient in the hospital, was inserted into the other arm. Full and regular pustules appeared on both arms, at the same time, and went through the same course, no difference between the two being observable. Had the disease of my patient been *chicken-pox*, one of the eruptions would have been suspended, until the other had gone through its course.

This case afforded another fact, which must not be omitted to be mentioned. My patient was the mother of three children; one of whom was seven years of age, the other three and a half. Both these had undergone vaccination at the age of eleven months respectively: i. e. the one six years preceding this occurrence; the other nearly three; and although they both resided in the same apartment, during the progress of the fatal small-pox in the infant, they remained altogether free from complaint; the cow-pock having, in this instance, effected a security, which the small-pox itself had failed to produce.

The other case, to which I have alluded, occurred under the observation of my colleague, Dr. Laird, in the summer of 1806. Being absent from town, at that time, I did not see the patient; and regret that my friend only published the following brief notice of it. His words are these:

"I avail myself of this opportunity to advert to another fact in the history of small-pox. The agitation of the vaccine question has, I think, clearly ascertained that one of our medical dogmas admits of some limitation. It has been proved that the same individual may be twice susceptible of the specific operation of the variolous poison. I conceive the following to be a case in point. During the course of last summer, one of my patients at the Public Dispensary, a boy 13 years of age, had the natural small-pox very severely. It was regular in its progress and duration: and yet, when a year old, he had slept in the same bed with his grandmother, while she laboured under this disease, which proved fatal to her; and at that period he was the subject of an eruption, accompanied with fever, and considered not only by his friends, but by a respectable surgeon, who attended him, to be genuine small-pox *."

The importance of attaining to accuracy in regard to the question involved in the preceding history, being, under the present circumstances, extremely great, I may perhaps be allowed to trespass farther on the time of the Society, while I notice a few similar facts, which stand on record. To attempt to impugn a doctrine, which is at least as old as the Arabian † schools, and has appeared to be confirmed by the experience of every succeeding age, would perhaps be considered as the height of temerity, if not of folly; but when we reflect, that until a very recent period, the phenomena of dis-

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* See Edin. Medical and Surgical Journal, Vol. iii. p. 155.

† Even the Arabians admitted that, when the first *fermentation* of small-pox did not expel the whole of the *menstrual* humours from the body, subsequent *ebullitions* would take place, and the small-pox would occur a second time, sometimes even a third, but very rarely a fourth time. See Diemerbroeck, de Variolis et Morbillis. Cap. iii.

eases of the eruptive class were very imperfectly discriminated,—that down to the time of Diemerbroeck and even later, the small-pox and measles were deemed varieties only of the same disease *—that the small-pox and chicken-pox were not properly distinguished until near the close of the 18th century,—and that numerous authors have successively described examples of the recurrence of small-pox †;—the attempt might appear to be less extravagant. This very inaccuracy, however, of the old writers renders their descriptions of the recurrence of small-pox extremely questionable: and it cannot be doubted, that many of the cases described by them, and by others, referred to by Burserius ‡, were instances of chicken-pox; and that others, in which the disease has been said to recur five, or seven times §, or still more frequently, were either altogether fabulous, or that different eruptions were mistaken for small-pox. We cannot, at least, put the authority, on which such

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* Loc. cit. cap. xiii. De Morbillis. "Differunt a variolis accidentaliter; seu secundùm magis et minus."

† See *Van der Wiel,* Observationes Medico-anatomicæ. Cent. II. 42.—*Hagendorn,* Hist. Medico-physicæ, Cent. II. Obs. 60.—*Journal des Savans,* Tom. 11. p. 417. 1759.—*De Haen,* Rat. Med. P. IX. Cap. VII, &c.—*Diemerbroeck,* loc. cit.—*Forestus,* Lib. VI. Obs. 43, &c.

‡ Institut. Medicinæ, Vol. II. p. 157.

§ See *Borelli,* Histor. Medico-physicæ. Cent. III. Obs. 10. *Paullini,* Observat. Med. Cent. III. Obs. 27.—Ephemerides Natur. Curiosor. Dec. II. Ann. IV. Obs. 29.

histories are related, in competition with the testimony of a Dimsdale or a Woodville, who are said to have discredited the recurrence of small pox, except in the *local* form before-mentioned.

With respect to Dr. Woodville, however, this statement is not correct. Mr. Ring informs us, on the authority of Mr. Ridout, who attended a child, affected by a second attack of small-pox along with Dr. Woodville, that Dr. W. admitted it to be " the second instance he had seen, in which there could be no doubt of the fact*." And Dr. Woodville once stated to me, in answer to a question, respecting his experience on this point, that not a year elapsed, in which one or more children were not brought to the Small-pox Hospital, labouring under small-pox, but who were said by the parents to have previously gone through the disease. Dr Woodville admits, too, in his History of Inoculation, (page 217) that a fact, stated by Dr. Deering of the recurrence of small-pox in a boy (a son of Dr. Croft), who had previously suffered the disease in a confluent form, had not been contradicted. Dr. Adams, his successor at the Small-pox Hospital, allows that examples of such recurrence, in our own days, are both numerous and well authenticated†."

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* See Med. and Phys. Journal, Vol. XIV. p. 406.

† See Med. and Phys. Journal, Vol. XIV. p. 195.—Also, Answers to all Objections against Vaccination.

Instances of a second infection, communicated like the case which I have detailed, by nursing patients under the disease, are indeed exceedingly numerous. Mr. Ring has collected, with great industry, a variety of such examples, which appaer to be well established both by the circumstances and by respectable authority. In five cases of this sort, females, who had suffered severely from the small-pox, when young, received the disease a second time, with considerable constitutional indisposition; in one of them upwards of 100 pustules appeared; in another 300; in a third 10 or 12; and in a fourth "an eruption all over the body*." Similar cases are mentioned by other authors†.

There are many examples on record, both in our own time, and in the age immediately preceding, when the small-pox was well understood, in which decided, severe, and even fatal small-pox have been observed a second time in the same individual from a more casual infection. One of the most striking is the case of Mr. Langford, related in the 4th Vol. of the Memoirs of the Medical Society of London. This person's countenance was "re-

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[*] See Med. and Phys. Journal, Vol. XIV. p. 402.—Vol. XV. p. 434.

[†] Ibid. Vol. XII. p. 318. by Hensler, &c. Mr. Moore mentions a lady of his acquaintance, who was infected, in this secondary way, with slight indisposition, six successive times when suckling her children. See his Reply to the Antivaccinists.

markably pitted and seamed" by a former malignant small-pox, " so as to attract the notice of all who saw him;" yet at the age of 50, he was attacked again with confluent small-pox, of which he died; having infected five of the family, one of whom also died.

In the case of Miss Price, published by Dr. Adams, the small-pox, produced by inoculation in her infancy, had left some visible marks on the face; yet she lately had a full eruption of distinct casual small-pox. She had had the chicken-pox when a child*.

A writer in the *Journal des Savans* †, has described a similar occurrence of small-pox, in a young woman, who was marked by a previous attack of the disease. He was unable to account for it, until he found, that she had slept in sheets used by a child labouring under small-pox. The writer seems to have been aware of the " *variole volante*," (doubtless the chicken-pox), occasionally occurring after small-pox, with a slight fever of twenty-four hours duration.

De Haen relates several instances, in his different works, of the recurrence of small-pox; among which are the following.

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* Answers to all Objections, &c. App. II. p. 31.

† Tome IX. for the year 1759, page 417.

The daughter of a Florentine nobleman was inoculated in 1761; but, although the arm exhibited the usual appearances, the pustules on other parts were few, and dried up in a few days; insomuch that the family were doubtful of her security; but their doubts were removed by the opinion of those experienced inoculators, Tozzetti and Condamine. Her brothers, however, were inoculated in 1763, when she received the infection from them, and had a copious eruption of distinct small-pox*.

De Haen likewise relates, that a student of law at Helmstadt, about 20 years of age, took the small-pox in the casual way; his face was swelled, and the pustules were numerous, and surrounded by a red circle; a secondary fever took place on the 6th day; the pustules became confluent in a few places, in which pits were left. He went to pursue his studies at Frankfort, where he died, three years afterwards, of the confluent small-pox; in which the eruption was very copious, depressed, and no redness surrounded it †.

The same author also describes the cases of the daughter and two sons of Dr. Krapf, Archiater to the Archduke Leopold, from his own diary; all of whom appear to have gone through two very decided attacks of small-pox, in the spring and summer of the same year.

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* Ratio Medendi, P. IX. Cap. VII.

† Loc. cit.

In another publication * he has detailed other instances, which appear to be equally unequivocal; three of these occurred in a noble family, in Vienna, and were attended by De Haen and Molinari. The circumstances in one of the three are related as follows:

"Filia autem natu major, verno tempore anni 1760, variolas alteras passa est. Testari id possum, cum sæpius illam, una cum Clariss. *Molinari* inviserim. Discretæ quidem multis in locis erant, at quoque in multis cohærentes, confertissimæ adeo, ut in facie, brachiis, cruribus, vix daretur sine papulis locus. Gravis utique fuit morbus. Salivatio incepit mox ab eruptione, continuavit ad undecimam morbi diem, adeo copiosa, ut, mensurâ de industria captâ, sesquilibræ vas quotidie expleret; post undecimum vero sensim decrescens, tandem ad decimum quartum cessavit. Hanc autem aliquando imminutam, pectusque ac guttur angustantem, continuatis mane ac sero balneis brachiorum et crurum, potu multo, injectione in fauces, gargarismis, et auctiore imprimis mane ac vespere opio, feliciter semper restituimus, venam secare nondum coacti.

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* Ad Perillust. *B. L. Tralles*, Epistolam Apologet. Responsio p. 11. See also *De Haen's* Quæstiones super Methodo Inoculandi Variolas, &c. Likewise *Hagendorn*, Historiæ Medico-physicæ, Cent. II. Obs. 60. and *Sarcone*, Epist. ad Hallerum V. in both of which, instances of a fatal recurrence of small-pox are related.

"Igitur hæc nobilissima virgo, quæ ante elapsos duos cum dimidio annos, graves adeo variolas passa erat, nunc iterum et copiosissimas, et molestissimas, et multo diuturnoque ptyalismo sociatas, habuit."

Besides the cases above stated and referred to, numerous others are on record, to which I have not found access: and some treatises have been written expressly upon the subject, which are probably not to be found in this country. Such are *Gerardi*, Ritorno di Vaiuolo, Padua, 1776;—Loeber, Sendschreiben von dem Wieder-kommen der Pochen, &c. Erfurth. 1767;—Medicus et Petit, Deux Lettres sur la rechute de la contagion de la Petite Verole, Manheim, 1767;—which I have not seen.

Enough, however, has probably been stated to render the occasional recurrence of small-pox unquestionable; and at least, to make us pause, before we reject the evidence which may come before us, on the subject; and to lead us to a careful and accurate examination, where appearances, tending to invalidate the received dogmas, occur. It will not therefore be necessary to recapitulate the examples adduced, to the number of 60 or 70, by Mr. Ring*, many of which, although founded upon the testimony of unprofessional persons, are very circumstantially detailed;—not to quote the authority of Pallas, who, I am informed, mentions that he was detained, when on his travels, by his daughter falling ill of small-pox, which she had before suffered;—nor to repeat the statements of the second attack of the disease in the person of Louis XV. of France, in whom a former occurrence from inoculation had been publicly announced;—neither shall I recur to the cases, of which we have only oral evidence, and several of which were mentioned in this Society on a former evening. These latter statements receive a higher degree of probability, from the well established evidence of the former cases; and the whole cannot but lead us to the opinion, that, upon a close and faithful investigation of facts, it will be found, that the small-pox occasionally occurs a second time, or oftener, in every degree of severity, from the few local pustules, unaccompanied by constitutional indisposition, which are occasioned by mere contact, up to the most general, and malignant disease.

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* See his Treatise on Cow Pox, and various Numbers of the Medical and Physical Journal, especially in Vols. XII, XIV, and XV.

A CASE

OF AN

UNUNITED FRACTURE OF THE THIGH,

CURED BY

SAWING OFF THE ENDS OF THE BONE.

BY GRIFFITH ROWLANDS, ESQ.

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, LONDON, SENIOR SURGEON TO THE GENERAL INFIRMARY, AND SURGEON TO THE LYING-IN CHARITY, CHESTER.

COMMUNICATED

BY JOHN ABERNETHY, ESQ.

Read February 13, 1810.

JOHN THOMAS, aged 53, a tall strong man, was knocked down by the falling of a tree, which broke his thigh nearly in its middle. A bone-setter in the neighbourhood was called to his assistance, who bound up the limb and continued attending him *many weeks*. The poor man having lain in bed for a longer period than was considered necessary by his friends, in such cases, took the opinion of a regular practitioner, who undeceived him as to his prospect of recovering, and advised him to place himself under my care.

The patient being rather unwilling and very unequal to undertake a journey of forty miles to Chester, contented himself with wearing a strong leathern case round his thigh, which enabled him, with crutches, to move from one room to another. However, being at length completely wearied with his inactive life, and his little farm greatly wanting his attendance, he was brought in a cart and admitted into the infirmary on the 28th of October, 1806, five months after the accident. The thigh at this time was considerably wasted, four inches shorter, and the fractured ends of the bone so far separated, with a fleshy substance between them, as to make it impossible to bring them together.

He was a man possessed of an excellent understanding and firm resolution. I stated to him that there was a chance of curing him, by sawing off the ends of the bones; but, in attempting to do so, I might unavoidably cut an artery, that would make it necessary to take off his thigh to save his life. He submitted readily to the experiment, requesting, if he could not be otherwise relieved, that the limb might be taken off. The patient being ordered for some days to live on the milk diet, and his bowels being properly attended to, the operation was performed on the 12th of November, in the following manner.

A tourniquet being applied, but not tightened, I began an incision three inches and a half above the fracture, and continued it between the rectus and vastus externus muscles, to the same length below it. A few strokes of the scalpel laid the bone bare, and the *upper* portion was easily separated from its connection with the surrounding parts. The end of the *lower* portion of bone was buried much deeper amongst the muscles, and a firmer adhesion had taken place; and I was obliged to proceed very slowly and cautiously in this part of the operation, on account of the extreme difficulty of avoiding an artery, which beat strongly against my finger as I directed the scapel. Having thus far succeeded to my wishes, I passed a strong plate of tin behind the denuded ends of the bone, and being provided with every kind of saw likely to succeed in such a case, I judged the business would be easily finished. In this I was disappointed, for after some disturbance to the patient and much fatigue to myself, I found it necessary to make an incision across a great part of the vastus muscle, by which means I was enabled, with a common amputating saw, very easily to take off the ends of the bones. The upper portion being first removed, I had an extension made on the limb, by which I ascertained that two inches of the lower portion were to come off. There not being a single artery to tie, the lips of the longitudinal wound were brought together with strips of adhesive plaster, and the lateral incision somewhat approximated by the same means; but left sufficiently open to afford an easy vent to the discharge from the inside of the wound. Pledgets of cerate on lint and tow were next applied, with compresses of soft linen retained with a tailed bandage. A long sort of strong splint, reaching from the buttock to the foot, with a joint at the knee, to vary the posture, supported the limb underneath, and a common wood splint on each side, and one on the top of the thigh, made the whole secure. In this state the patient was laid in bed on his back, and by the aid of an opiate passed an easy night.

It would be needless and tiresome to enumerate the different remedies employed in this case, which the particular symptoms required. The wound was dressed on the 16th, and looked well, the bones being perfectly apposite.

The discharge was considerable, and continued so for many weeks; during which time, I found the lateral incision of great importance, as a convenient drain to the discharge, and I recommend it to be adopted in all similar cases. The wound was completely healed in three months; but the re-union of the bone was weak for a long time. On the 14th of April, 1807, he returned home, and soon was able with a stick and a high-heeled shoe to follow his usual occupation.

He died of a fever about a year ago.

Though I have several times performed all of the principal operations that occur in Surgery, and very often many of them, I confess this far surpassed any thing I had ever undertaken or witnessed, and I am doubtful as to the propriety of recommending it to be done by others.

A CASE

OF

MALFORMATION OF THE HEAD,

CONSTITUTING

WHAT IS COMMONLY CALLED AN ACEPHALOUS FŒTUS.

BY

MR. BURROWS, SURGEON.

COMMUNICATED BY

DR. YELLOLY.

Read March 13, 1810.

THE malformation, which forms the subject of the following case, is not of very rare occurrence. The subjects of it generally live too short a time for observation, and accurate dissections have been seldom made. But in this case, life was protracted beyond the usual period, and the parents of the child offered no objection to a complete investigation of the disease.

On the 31st of August, 1809, I was called to a case of midwifery in Duke-street, Spitalfields, it being a lady's second child. On examination I found the face of the child was turned towards the os sacrum; and on feeling for the forehead, instead of the usual projection of bone, a soft spongy substance was found projecting over the eyes.

When I touched this substance with my finger, the mother described that she perceived most violent motion of the child, which, she said, felt "*as if it would break through her*," and I prepared two ladies who were present, for some unnatural production, and begged them to convey the child, as soon as it was born, into an adjoining room from the view of the mother.

The face soon descended into the pelvis, but I avoided examination as much as possible during the pains, on account of the violent motion which touching the tumour excited. The labour pains, though strong, were more numerous than the size of the projecting part would have induced me to expect; but this circumstance was afterwards accounted for by the magnitude of the body of the child which was born after I had been with my patient a little more than an hour.

The head of the child appeared very remarkably deformed; the whole of the forehead, summit, and a great part of the occiput were deficient, and in lieu of them, a substance projected of a light mulberry colour, and of the mushroom form, excepting that its neck was proportionably broader. From the deficiency of bone, the eyes appeared to project much more than usual; the body of the child had its usual colour, and in every other respect it was naturally formed.

The child lived six days without either taking sustenance or having any evacuation. Attempts were frequently made to give it food; but when the smallest quantity entered its throat, it excited convulsions and immediate regurgitation.

The infant was a female, and a probe was passed both by the meatus urinarius and rectum, to ascertain whether there was any impediment to the natural evacuations. A very small quantity of fluid passed from the bladder, but nothing from the rectum.

No diminution of size could be observed during its life, for it seemed on the morning of the 6th day to be as large and as likely to live as on the day of its birth, and it died of a convulsive fit on the evening of the 6th day.

Respiration went on naturally; it did not cry, but frequently made a hideous whining noise.

The pulse did not appear to differ from that of other children, but the heart could be seen to beat violently on the left side, immediately after it had been thrown into convulsions.

If left without disturbance, it exhibited no sign of convulsions, but the least motion immediately excited them. No signs of voluntary motions appeared, and the mother had less feeling of the child in utero, than in her former pregnancy. But the most curious circumstance observed in this child was, that at the moment the projection at the summit of the head was touched, a general and violent convulsion was produced, as if it had received the strongest electric shock. Its arms were first drawn up and then extended, and its hands were turned into a state of pronation; its legs were stretched to the utmost degree of extension; its head was drawn back, and its body extended.

Sir Wm. Blizard and Mr. A. Cooper were so kind as to visit the child with me, and one of these gentlemen applied a piece of silver to one part of the projection, and a piece of silver to another, and produced a communication between these by means of a silver probe, but without exciting any galvanic contraction.

The following were the appearances on dissection:—

The scalp, the os frontis, the parietal, and a great part of the occipital bones were wanting.

Through the parts at which these bones were deficient, the cerebrum projected; and this portion of the brain exhibited the usual convolutions of that substance. It was covered by the pia mater; it was of a mulberry colour; appeared to be more vascular than the pia mater usually is, and the edge of the scalp was united with the neck of the tumour.

The cerebellum was not more than one-fourth of its usual size, for the posterior part of the os occipitis had advanced towards the Sella Turcica, so as to form a cavity for the cerebellum, into a canal about twice the size of that which is destined for the spinal marrow.

The child in every other respect was perfectly formed.

This altered situation of the brain had so far injured its powers as to deprive the child of all voluntary motion; for it did not seem capable, under any irritation that could be applied to its extremities, of having any action excited in its voluntary muscles. But the most curious circumstance in the physiology of this child was, that its secretions were entirely stopped, and it had therefore neither alvine nor urinary excretion.

A circumstance which will serve to support the idea lately broached by physiologists and chemists, that the secretions depend upon an influence which is derived from the brain and nervous system.

A CASE

OF

WOUND OF THE HEART.

By J. FEATHERSTON, Esq.

COMMUNICATED BY

ASTLEY COOPER, Esq.

Read April 24, 1810.

RICHARD HOLLIDGE, a private in the Northampton Regiment, being on sentry on Thursday night, at 10 o'clock, March 29th, with an unfixed bayonet in his hand, slipped down, and the bayonet entered his side between the sixth and seventh ribs, running directly upon the superior edge of the latter. He was some yards distant from the gate at which he was posted, and being challenged, returned to open it with the bayonet still remaining in the wound; he was incapable of withdrawing it himself, and the person coming in extracted it for him. I was called to him within five minutes of the accident; he was then in a state of syncope, the extremities cold, and his pulse scarcely perceptible. In about the space of a quarter of an hour he gradually revived, did not complain of any severe pain, and expressed, "that he believed he was more frightened than hurt." I examined the wound with much diligence, but could not trace its extent farther than one inch and a quarter, though it was evident the bayonet had penetrated two inches: the hemorrhage was very inconsiderable. His wound was dressed, he was conveyed to the military hospital, and put into bed; he was incapable of laying on his right side; but slept tolerably well. On visiting him the following morning, March the 30th, he complained of lancinating pains extending from the wounded part across the chest, and of severe fugitive pains in different parts of the abdomen, his pulse was quick and thready, and tongue white and dry: these symptoms led to a suspicion that the pleura costalis, at least, was wounded, though no opening could be ascertained extending into the cavity of the chest. Sixteen ounces of blood were taken from his arm, a solution of magnesia vitriolata administered, and fomentations applied to the abdomen. He was obliged to be supported in bed nearly in a sitting posture, as respiration became much impeded when perfectly horizontal; in this position he appeared to breathe with freedom. In the evening he expressed himself in every respect much relieved; his pulse was less quick, and had lost its thready sensation; tongue more moist; his medicine had operated moderately. On the following morning, March the 31st, I found he had passed a good night, his pulse was calm, and steady, scarcely quicker than natural, and the tongue quite moist; the lancinating pains had subsided, and he merely complained of a trifling pain in the wounded part: this was increased by a slight cough, with which he became affected only this morning, and which was unattended by any expectoration. His aperient draught was repeated, an emulsion ordered for his cough, and the antiphlogistic regimen strictly adhered to. Throughout the day he was walking about the ward, in very good spirits, quite jocular in his conversation with his fellow patients, and expressed himself to them, that "low diet would not do for him any longer." He retired to rest about 9 o'clock, and fell asleep; at 11 he got out of bed to the commode, had an evacuation by no means costive, said "he felt himself chilly, and a sensation that he should die," returned into bed, and expired immediately; making a period of 49 hours from his first receiving the wound.

I dissected his body the following morning, in the presence of two other surgeons. On opening the chest, the pleura was found slightly inflamed for some distance around the puncture, and an effusion of coagulable lymph, uniting a small portion of the lung to the wounded part: the lung however was quite uninjured. At least two quarts of blood were effused into the cavity of the chest; the pericardium was nearly filled with blood, and had a puncture through it, extending three quarters of an inch into the muscular substance of the left ventricle, about two inches from its apex. A small coagulum of blood was formed at the edge of the wound through the pericardium.

Upon opening the left ventricle of the heart, the bayonet was found to have penetrated the substance of the ventricle, and to have cut one of the fleshy columns of the mitral valve.

On a review of this case, I conceive it very curious, that an organ like the heart, possessing such excessive irritability, a part to which the most interesting of our sympathies are referred, and which is in some degree influenced by the most trifling, should be so materially wounded, and yet the system take so little cognizance of the injury. Death, in this case, it was perfectly evident, was not produced from any alarm excited in the system by the wound, but occurred, as a secondary consequence, from the hemorrhage increasing to such an extent, as to interrupt the actions of the heart and lungs. That the hemorrhage proceeded chiefly from the heart, must be admitted; there was no symptom whatever, which indicated a wound of the lungs; none could be found on the most deliberate examination; and the intercostal artery was entirely free from injury.

HISTORY
OF AN
EXTRAORDINARY ENLARGEMENT
OF THE
RIGHT LOWER EXTREMITY;
WITH
A DESCRIPTION OF SOME MORBID CHANGES IN THE PAPILLÆ OF THE CUTIS.

BY THOMAS CHEVALIER, ESQ. F. L. S.

SURGEON EXTRAORDINARY TO THE PRINCE REGENT, AND SURGEON
TO THE WESTMINSTER GENERAL DISPENSARY.

Read June 19, 1810.

SEVERAL cases are recorded, in which a very great and permanent enlargement has taken place in one or other of the extremities: one in particular, of the right upper extremity, is described in the fifth volume of Haller's Disputationes Chirurgicæ; but I have not yet met with any instance exactly resembling the following; which, on account of the extraordinary magnitude of the limb, and the curious alteration, which was produced in some parts of the cutis, will, I hope, appear worthy the notice of the Society.

December 15, 1803, I was desired to visit Sarah Rogers, who was then 46 years of age, and had been labouring fourteen years under an enlargement of the right lower extremity. The disease had existed nine years before the limb became so unwieldy as to prevent her going about; but for the last five years, she had been entirely confined by it. It had continued gradually to increase in size; so that at the time I first saw her, it measured three feet six inches round the middle of the thigh, and two feet round the calf of the leg. The whole length of the limb measuring from a little above the great trochanter of the thigh-bone, was three feet three inches; at this part the enlargement terminated by an almost definite line.

The bulk appeared to arise chiefly from an extraordinary growth of skin and adipose membrane; for both the knee and ancle joints retained as much flexibility, as so enormous an increase of the substance surrounding them could possibly admit: nor was any particular pain produced by attempting to move them.

The enlargement was proportionally greatest in the skin on the top of the foot, which was so immensely expanded as to project several inches beyond the toes, overhanging them, so that all, except the great toe, were embedded in it. On the under surface of the foot and toes, and also on part of its upper surface, the skin had yielded irregularly, and in some parts it was elevated into tubercles which were exquisitely sore, and many of which from time to time withered at the base and dropped off. The cuticle was every where thin and chapped. In some parts, particularly at the bottom, it was sodden, being continually moistened by a serous fluid, which was discharged from almost the whole surface of the limb, and which, by its quantity, greatly impaired the patient's strength. The whole surface was inflamed and tender, and she was at times in considerable pain, though not so much as the magnitude of the disease would have led one to apprehend. The left leg was not at all enlarged in any part.

She informed me that the swelling first arose after a labour; which, it seemed, was succeeded by an attack of the Œdema Puerperarum, or, as it has been called, Phlegmasia Dolens; this somewhat subsided, but never completely disappeared. After she began to go about, the tumefaction again augmented, and extended higher, and from that time it gradually continued to increase in bulk, and to become more painful, till it had attained the magnitude and appearance I have described.

No material alteration took place after I first saw her, till about a fortnight before her death, when a small portion of skin sphacelated, at the extremity of the projection from the foot; and at the aperture formed by this occurrence, a considerable quantity of serous fluid drained off from the cellular membrane, by which the size of the limb was in some degree reduced, but not so much as might have been expected. She lingered till Sept. 28, 1804, when her sufferings terminated in death.

My friend Dr. Jackson was so good as frequently to visit the patient with me, and at his request, an artist of no common attainments took a whole length figure of the poor woman, in which every circumstance of proportion, colour and appearance, is most accurately pourtrayed*. From this painting which is in Dr. Jackson's possession, the annexed drawings have been made. Fig. 1 shewing the general appearance of the limb and its proportion to the rest of the body, and fig. 2 representing more particularly the appearance of the foot.

I examined the limb after death, and found the disease entirely confined to the skin and adipose membrane: of the increase of the latter some idea may be formed, when I mention, that its thickness in front of the tibia, was full an inch and a half: although, as will be seen from the drawing, the anterior surface of the limb was flat, the augmentation having been greatest laterally, excepting in the foot only. The muscles were slender and pale, as might have been expected from long disuse; but they lay in their natural relative situations, with respect to the bone and to each other, the disease not having at all extended into the interstices between them. There was no alteration in the state of the bones, or of the joints. Neither the femoral artery, nor its principal branches were at all enlarged, nor could I detect any change in the absorbent glands, either at the groin, or within the pelvis. I was not permitted to remove the whole limb, or I should have endeavoured to inject the absorbent vessels, but I doubt much whether any light would have been thrown upon the disease, had this even been done.

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* This painting is now in the Museum of the Royal College of Surgeons.

As the chief alteration of structure in the skin had taken place in the foot, I took this home, and injected its arteries with fine injection, in order to ascertain more perfectly the change it had undergone. The cuticle was very loosely attached, and was unusually brittle on the upper part of the foot, so as not to separate in large pieces, but to break away in furfuraceous scales or bits: on the under surface, however, except where a few tubercles had arisen, it had nearly its natural appearance, so also had the nails, except that they were much softened by the fluid which exuded from the surface, and had kept them constantly moist. Near the heel, the cutis itself had not undergone any material alteration; but over great part of the upper surface, the cutaneous papillæ were excessively enlarged, and elongated into pendulous inverted cones rounded at the end. The progress of this change may be distinctly traced in different parts of the preparation, with a glass of small magnifying powers, from the smallest eminence to the state in which they are represented in fig. 3. Each papilla is furnished with an artery of its own, which, where the injection has been most successful, terminates in villi upon its surface; it was in that part of the foot where this change was most remarkable, that the patient complained of the greatest pain and soreness.

The villi at the extremities of the toes are at some points simply elongated, at others they are accompanied by papillæ resembling those already described, but longer and more pendulous. Some of these are represented by fig. 4.

In addition to these changes in the more vascular parts of the cutis, I must not omit to mention the great increase in the thickness of the corium, which was in some parts near a quarter of an inch, and on being cut into, presented the same grained appearance which is observable in a section of the hides of the larger quadrupeds.

Since this case occurred, I have had an opportunity of seeing one instance in this country, of what I conceive to be the true Egyptian Elephantiasis; as it perfectly accorded, in every particular, with the description given by Mr. Bruce in his travels, book v. chap. 2. As this disease is very different from some other affections which have been called by that name, and as I have ascertained that it chiefly consists in a change which the cutaneous papillæ undergo, I trust an account of it will not be thought an improper addition to the history before recited; especially as travellers have only described the external appearance of the disease, and no one, that I yet know of, has examined the altered structure of the parts affected by it.

The subject of this complaint was also a female, whose legs began to swell shortly after the cessation of the menses, and gradually assumed the structure and appearance from which the disease has been so properly named. For the last two years of her life, she was confined to the chair in which she sat, being incapable of lying in bed. She was utterly unable to bear being lifted up into the erect posture, and could only be gently raised from her seat, with excessive pain, to pass the customary evacuations. Mortification at length came on and put a period to her misery, at the age of sixty-seven.

I examined the limbs after death, and took away a portion of the skin, to which the disease was entirely confined, but I could not remove either leg for injection. On examining the skin, the change produced was chiefly in the papillæ of the cutis, each of which appeared elongated and enlarged into a roundish tubercle, over the surface of which, a thick, and almost horny cuticle grew, giving to the surface its dark colour and rough appearance. In the upper part of the leg, these tuberculated papillæ were smaller, and the cuticle thinner; but in the lower part they were large, and the tumefaction was so great, that the foot projected very little beyond the leg, more than the length of the toes. These larger tubercles were exquisitely painful in themselves, and were undoubtedly rendered more so by the horny cuticle dipping down into all their interstices and pressing upon them. Their appearance, after the cuticle was separated by maceration, in the various stages of their growth, is represented in figs. 5, 6, and 7. In the preparation from which the latter is taken, the cuticle has been left on in some parts, as at A, to shew its extension into their interstices.

From this account, it will appear that the true elephantiasis is a disease totally distinct from some cutaneous affections which have been called by that name. One of these is an excoriated state of the skin, which forms an imperfect cuticle, or rather a hard crust, not much unlike, in its appearance, to the true elephantiasis; but when this crust is separated, the cutis underneath is found smooth, and but little, if at all, changed in its structure.—This occurs mostly in the leg, but sometimes takes place in other parts.

Another disease which has been denominated elephantiasis, is that which now and then occurs in this country, but is endemial in some of the West India Islands, and is generally known by the name of the *Barbadoes leg*, as this also most commonly affects the lower extremity: it sometimes however attacks other parts: I have seen it in the arm, the penis, and several times in the scrotum. But in these cases, the *cuticle* is not much increased in thickness; it has not the dry, horny, and lineated appearance observable in the skin of the elephant, and to which it had a very close resemblance in the case above described; neither is there any appearance of enlargement in the papillæ of the skin, which retains nearly its natural colour, and has rather a shining surface. In the Barbadoes leg, moreover, the foot equally partakes of the disease, and the patient can generally walk about even in its advanced stages; whereas in the true elephantiasis, the foot is only secondarily affected, by the swelling of the leg extending, so as to embody itself as it were with it, leaving the skin of whatever portion projects beyond the leg, uncontaminated. Moreover the horny state of the cuticle, and the exquisite sensibility of the deceased papillæ, would render it impossible for the patient to walk, in the advanced stages of the true elephantiasis.

A disease affecting the face, which produces ulceration, and sometimes destroys the alæ nasi, has also been called elephantiasis, but very improperly; for in the elephantiasis no ulceration takes place, nor is there any similarity between the two diseases.

I will just add, that in a case of ulcerated leg, attended with a disease of the tibia, where the skin round the edges of the sore was remarkable for that appearance which has been termed *callous*, on injecting the limb, after it had been removed by amputation, I found the papillæ of this callous portion of skin enlarged into distinct, and slightly inflected cones, as represented at A, in fig. 8. On the cuticle being turned down at B, a separate sheath of corpus mucosum was found to have invested each papilla distinctly, together forming a most beautiful illustration of the papillary structure of the cutis, which is perfectly preserved in the preparation now in my collection.

T. CHEVALIER.

Note.—Since the first edition of this volume was published, I have seen another case of diseased legs, in which the papillæ of the cutis put on the same appearance as in the case of elephantiasis above described: but the discharge of a large ulcer on each leg prevented the cuticular covering from accumulating on them. The pain, however, was most exquisite, and the patient was unable to lie in bed night or day.

T. C.

AN ACCOUNT

OF

A SEVERE CASE OF ERYTHEMA,

UNCONNECTED WITH

MERCURIAL ACTION.

By ALEXANDER MARCET, M.D. F.R.S.

ONE OF THE PHYSICIANS TO GUY'S HOSPITAL.

Read Nov. 20, 1810.

WITHIN these last few years a remarkable cutaneous affection has been accurately and minutely described by various writers * under the names of *Eczema Mercuriale, Erythema Mercuriale* † or *Hydrargyria* ‡, a disease considered by these writers as necessarily connected with mercurial action. The most characteristic symptoms of this disease, are a sudden desquamation of the cuticle all over the surface of the body, with an ichorous discharge, and a general redness and tumefaction. My motive for laying before the Society an account of the following case, is, that it affords in the same individual, distinct and repeated instances of an affection, the symptoms of which closely resemble those of the abovementioned disorder, though quite independent of any mercurial action.

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* Mr John Pearson was one of the first medical observers who noticed and distinctly described the disease which is the subject of this paper, to which he gave the name of 'Eczema Mercuriale.' He had been in the habit of mentioning it in his lectures on surgery, ever since the year 1783, and he afterwards published, in 1807, a minute account of it in the second edition of his valuable "Observations on the effects of various remedies in the cure of the lues venerea." These circumstances did not come to my knowledge until after the first editions of this volume were published, and I am happy in having an opportunity of rectifying this omission in the present edition.

† See a paper by Dr. Spens in the 1st vol. of the Edinburgh Medical Journal.

‡ See Dr. Alley's Treatise on Hydrargyria

The subject of this singular disease is a gentleman about 30 years of age, rather of a spare habit and of a pale complexion. I attended him for the first time in March, 1808, when I noted the following particulars:

This gentleman's complaint is apt to recur at irregular periods, and he has been subject to it, more or less, ever since the age of 16. He is married and has healthy children. Neither his parents, nor any of his relatives have ever been affected in a similar manner.

The attacks of the disease are generally preceded for a few hours, by what he calls a twinging sensation at the pit of his stomach, but without nausea, fever, or even loss of appetite. He then begins to feel a sense of stiffness and heat in various parts of his body; these parts, in a few hours, are observed to become red, and to swell rapidly to a considerable degree. The hands, the feet, the ears, and the lips, are the parts which the disease principally attacks. But it also frequently appears in the face and eyes, and sometimes even in the hairy scalp. Indeed in the severest attacks there is no part of the body which can be said to be totally exempt from it. The extremities however, especially the hands and feet, are by far the most conspicuous seats of the complaint.

When the parts are attentively examined on the 2d or 3d day of the disease, the cuticle appears to be raised in innumerable small vesicles, some of which are distinct, so as to give a roughness to the surface, though most of them are confluent, forming an uniform swelling with a shining appearance. Soon, however, on the swelling abating, which commonly happens on the third or fourth day, the cuticle begins to crack, and to rise in patches, discovering an inflamed surface with numerous small superficial ulcerations from which there oozes a fluid having a strong disagreeable smell. On the extremities, and in the bend of the toes and finger joints, pretty deep fissures or ulcerations are formed, which however heal readily, and in a day or two the cuticle falls off in large patches, sometimes as large as the hand, presenting an appearance which may be best compared to that of the trunk of a plane-tree when casting its bark. Sometimes the nails themselves are cast off, the new nail gradually pushing up the old one, which appears dead and withered. A few days after this, however, the new cuticle, which is at first red and inflamed, gradually assumes its natural appearance, so that in the course of about a fortnight or three weeks, from the beginning of the attack, the complaint is commonly entirely removed. But at other times, and at the moment when the patient thinks himself convalescent, the new cuticle becomes hard and dry, and cracks again as in the first instance, producing a repetition of the symptoms just described.

When I saw this patient for the first time (in March, 1808,) it was on the 4th or 5th day of the attack, which happened to be one of the most violent he had experienced for some years. The swelling was still conspicuous in many parts, and there were in both his hands, particularly in the palms, where the cuticle is the thickest, and between the fingers, deep cracks and ulcerations. He had, however, no fever, no thirst, no quickness of pulse, and he complained only of a sense of weight, heat, and stiffness in the affected parts. The corners of his mouth, the ears, and the feet were this time but slightly affected.

Although there was no distinct pyrexia attending these symptoms, yet there appeared to be a great degree of irritability, and a peculiar susceptibility or morbid sympathy of his stomach and nervous system. On looking at his hands for instance, he became extremely pale and faint, though without experiencing any actual pain; and on his stockings being taken off, he complained of a very peculiar and disagreeable tingling all over his body.

Finding that amongst a variety of remedies and applications which he had tried at various periods, with a view to relieve the immediate symptoms, he had never made use of poultices, I recommended a linseed-meal cataplasm, with 20 drops of the extractum litharg. acetat. to be applied to the hands. This produced a sensible diminution of the tension and swelling, and upon the whole great relief was obtained by this application. But soon after the removal of the poultices, the heat and stiffness gradually returned, so as to require a repetition, and an almost uninterrupted use of the same application; and even during his convalescence, (which took place in three or four days) and when the parts were fast returning to a natural state, he still found it expedient to have, occasionally, recourse to a poultice, in order to remove uneasy sensations.

With regard to internal medicines, having no distinct precedent to assist me in the choice of any particular treatment, and seeing evidently, from my first visit, that the patient was gradually recovering, I contented myself with regulating the state of the stomach and bowels. But with a view to prevent the recurrence of similar paroxysms, I suggested that he should try a course of sarsaparilla, that he should make frequent use of neutral salts, and above all, that he should give a full trial to the warm bath, a remedy which, 'to my great surprise, had never been recommended to him before.

Upon inquiring into the general history of this uncommon disorder, I was informed that the attacks had of late years recurred two or three times in each year, and appeared to have no connexion with particular seasons. Some of these attacks have been very slight, and they have sometimes been so partial as to be confined to one hand, or even to one finger. In these instances the patient thinks that the progress of the disease has been prevented by the use of nitre and aperient medicines.

This gentleman's general constitution appears to be delicate, though excepting the complaint above described, he is not subject to any habitual ailment. In general he sweats easily and profusely upon the slightest exertion when in health; but at the time of the attacks, he complains rather of a deficiency in that secretion. His diet is moderate, and he has in vain tried to trace his complaint to peculiarities of regimen. Once, upon a physician having advanced a suspicion that this cutaneous affection might have arisen from eating particular kinds of fish, he abstained from fish altogether for several months, and yet, whilst he was still under this plan of abstinence, he had a violent paroxysm of the complaint. When he was attacked for the first time, he was just recovering from a gonorrhoea, for which he had used some internal remedies, none of which had affected his mouth, or produced any salivation. He never was the subject of Syphilis.

I had so far endeavoured to sketch out the history of this disease, and upwards of two years had elapsed without my attention having again been directed to the subject, when, about the middle of last May, the same gentleman desired that I should see him again. I found him in a state perfectly analogous to that which I have just described, but with symptoms more severe than in the former instance, though still unattended with fever or other obvious constitutional affection. The desquammation of the cuticle all over his body was such, that on raising his bedclothes, the spot where he lay was found literally strewed with scales, and I do not overrate the fact in saying that a handful of these might easily have been collected. The hands, feet, lips, face, and even the eyes, especially the outer corners of the eyelids, were the parts most severely affected. The cuticle of the heels in particular, and that of the soles of the feet, came off in patches as large as the palm of the hand. This attack had begun about twelve days before I saw him, with a sense of oppression in the præcordia, and it was immediately preceded by, and (he thinks) obviously connected with, his having been exposed to a severe shower of rain. After raging for a few days, the complaint had in a great degree subsided, but had broken out again, just before I saw him, with redoubled violence.

I had the satisfaction of finding upon inquiry, that, with the exception of some slight threatenings, this was the only attack which he had experienced for the last two years, and he ascribed his having been so much more free from his complaint, during that period, to the frequent use he had made of the warm bath, and to the great attention he had paid to the state of his bowels. He had occasionally used cold sea-bathing with apparent benefit.

The same local treatment was adopted as in the former instance, namely, the application of poultices to the hands and feet; and with regard to internal medicines, I ordered a saline antimonial mixture, which by exciting a moisture on the surface, appeared to allay the tension and uneasiness. In the course of a week he was in a state of full convalescence.

It will give additional interest to the history of this case, to state, that Dr. Willan saw the gentleman in question once, when he had but a very slight attack of the disease. He thinks this disorder referrible to the genus of *Impetigo*, and it appears to him to answer nearly to the *Impetigo* tate of a bright yellow colour, inclining to orange, will appear at the point of contact, and will readily subside to the bottom of the vessel*.

In examining the circumstances attending the agency of this test, the following particulars were observed. On adding successively ammonia and nitrate of silver to distilled water, no precipitation takes place. Fowler's arsenical solution affords a precipitate of a yellow colour, similar in appearance to that produced by a solution of the white oxyd; but a solution of arsenic acid gives a precipitate of a red brick colour. The fixed alkalies, when substituted for ammonia, likewise produce a yellow precipitate; but the results are less distinct, since, in the circumstances in which the experiment is made, they decompose the nitrate of silver, an effect which ammonia does not produce. We found by comparative experiments, that the precipitates thrown down by the same re-agents, (namely, ammonia and nitrate of silver,) when either zinc, iron, copper, mercury, or lead, was contained in the fluid, had an appearance totally different from that produced by arsenic; and that the latter could readily be detected by the same means, notwithstanding the presence of these metals. The salts of copper or of lead, when previously mixed with a solution containing arsenic, occasioned no difference in the results. With a solution of oxymuriate of mercury, ammonia alone will occasion a white precipitate; but if arsenic be also present, on the addition of nitrate of silver, the precipitate immediately acquires a yellow colour. The efficacy of this compound test is not weakened, but, on the contrary, seems to be rather increased by the presence of sulphate of iron. Sulphate of zinc was not found to interfere with its operation, any otherwise than requiring a larger quantity of ammonia, in order to saturate the sulphuric acid; but when this has been effected, and the whole of the zinc precipitated, the addition of nitrate of silver produces the same yellow tint as in the other experiments. There is therefore reason to presume, that no admixture of metallic or other salts will occasion ambiguity, or enable the arsenic to escape detection, when the above test is properly applied*.

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* As this precipitate is soluble in ammonia, particular care should be taken to avoid adding it in excess; indeed, the quantity of either ammonia or nitrate of silver employed, can scarcely be too small for the purpose of detecting the presence of arsenic.

Being curious to determine the limit of minuteness in the quantity of arsenic discoverable by this test, we dissolved a grain of white arsenic in a known quantity of distilled water, and by successive additions of water to determinate portions of this solution, prepared other solutions, containing respectively $\frac{1}{10000}$, $\frac{1}{20000}$, and $\frac{1}{100000}$ of their weight of arsenic. By applying the test to a small quantity in a watch-glass, we found that when it contained only one 25,000th of a grain of arsenic, the precipitate was of a bright yellow colour. It was still distinctly yellow when the quantity of arsenic was reduced by dilution to one 50,000th of a grain. When further diluted, the yellowness was gradually less and less discernible, and the precipitate appeared of a light blue. It retained this colour until its quantity became too minute for observation. A bluish cloud was, however, very distinctly visible when the fluid examined contained only the 250,000th part of a grain of arsenic*.

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* In referring to the different tests that have been recommended for the detection of arsenic, Dr. Marcet pointed out to me a paper, published in the Philosophical Magazine for May, 1809, in which Mr. Hume has proposed boiling the suspected matter with a solution

If, along with the extraordinary degree of deli-

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tion of carbonate of potash, and bringing into contact with it a stick of dry nitrate of silver; a method of proceeding, which is somewhat analogous to the one I have described, but which appears much less convenient in its practical application. See Henry's Experimental Chemistry, Vol. II. p. 389.

* Dr. Bostock, in instituting a comparison between the different methods hitherto recommended for detecting minute portions of arsenic, says, that "he has no hesitation in giving it as "his opinion, that the most convenient, the most delicate, and the "most decisive process, is the one in which the green precipitate "is formed by the addition of the sulphate of copper." And he states it as the result of his endeavours to discover the degree of minuteness to which this test is capable of being carried, that it could detect arsenic when it formed one 2400th of the weight of the fluid. Edinburgh Med. and Surg. Journal, Vol. V. p. 170 and 174.

cacy of this test, we take into consideration the extreme facility of applying it, and the greater convenience of operating upon fluids than upon solid bodies, as we are obliged to do when we have recourse to the usual methods, it appears decidedly entitled to preference. I would, therefore, wish to point it out as deserving the attention of analysts, whenever the existence or the absence of arsenic in any substance is the object of their research*.

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* *Note to the 2d Edition.*—See a paper by Dr. Marcet in the third volume of the Medico-Chirurgical Transactions (p. 342), containing remarks on the chemical nature of the yellow precipitate obtained by this test, and pointing out certain precautions to be used in its employment.

Note to the 3d Edition.—See also a note, by the same, in the sixth volume of these Transactions, p. 663; in which some other important circumstances respecting the detection of arsenic are noticed, and the most eligible way of obtaining a tangible quantity (however minute,) of reduced arsenic, is pointed out.

EXPERIMENTS AND OBSERVATIONS

ON THE

SERUM OF THE BLOOD,

BY JOHN BOSTOCK, M.D.

OF LIVERPOOL.

Read April 23, 1811.

IN a paper which was published in the Transactions of the Medical and Chirurgical Society of London*, I maintained the opinion that blood does not contain any constituent to which the name of jelly or gelatine can be properly applied. As this opinion was in opposition to the highest chemical authorities†, I could not expect it to be received without opposition, more especially as the experiments which were adduced in its favour, were both few in number, and very simple in their nature. Since that time I have examined the subject with more attention, and I have endeavoured to vary the experiments in such a way, as to meet the objections to which the former were liable. It may be necessary to premise, that by the term

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* Medico-Chirurgical Trans. Vol. I. p. 47.

† See the references in the paper referred to, p. 69.

jelly, I mean that animal substance which possesses the characteristic property of being liquefied by heat, and becoming concrete by cold, and which forms with tan a compound that is insoluble in water.

By the modern authors who have written upon the blood, it is asserted, that when serum is coagulated by heat, the albuminous part alone is rendered solid, and that there may be separated from the coagulated albumen a fluid, which holds a quantity of jelly in solution. To this fluid, which appears first to have been distinctly recognized by Dr. Butt, Cullen restricted the term of serosity, which had been previously applied by Senac to the serum at large; MM. Fourcroy and Vauquelin first announced the existence of jelly in it, MM. Parmentier and Deyeux further developed the supposed discovery, and since that time its existence has never been called in question. The serosity may be procured either by permitting it to ooze spontaneously from coagulated serum cut into small pieces, or more readily, by digesting the coagulated serum in boiling water. If the quantity of water employed be not more than the bulk of the serum, the fluid is very nearly the same as obtained by either of these means; for, in consequence of the serosity being lodged in minute cells dispersed through the serum, which are penetrated by the boiling water, it is by this operation more completely separated from the albumen. The solid contents of the serosity generally amount to about $\frac{1}{50}$ of the weight of the fluid, but in different specimens I have found them to vary from $\frac{1}{46}$ to $\frac{1}{70}$. It is slightly opake, its taste is saline, and it has an odour which has always appeared to me specific, and different from that of serum; it is generally neither acid or alkaline, but occasionally I have thought that I could perceive in it the slightest degree of alkalescency *. When the serosity has the oxymuriate of mercury added to it, or when it is subjected to the heat of boiling water, no effect is produced, and I never could perceive that the slight degree of opacity which it naturally possesses was increased; but when the two operations are united, when the oxymuriate of mercury is added, and the mixture is kept for some time at the boiling temperature, there is a manifest increase of opacity, and a precipitate is formed. An infusion of tan always increases the opacity of the serosity, and a precipitate very gradually subsides from it †. When serosity has been exposed to the atmosphere for

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* The alkaline test which I generally employ is turmeric; it possesses the advantage of not being injured by keeping, and it is obviously affected by a solution containing $\frac{1}{2000}$ of its weight of potash.

† The preparation of tan which I have found the most convenient for the experiments, is formed by the extract of rhatany. If the rhatany be digested in hot water, and filtered after it becomes cold, a solution is formed of nearly uniform strength, and which remains a considerable time without moulding or undergoing any spontaneous change. In both these respects it is superior either to catechu or to galls.

some days, it becomes more opake, a flaky substance separates from it, and its odour is extremely nauseous: in this state it exhibits an excess of alkali. I have never been able to detect any degree of acidity during its spontaneous decomposition, although this has been asserted to be the case *. When the serosity is evaporated by a gentle heat, it gradually becomes less clear, small flakes are formed in it, and at length a semitransparent substance is left, of a membranous appearance, which evidently consists, at least for the most part, of animal matter. By exposure to a greater heat, it grows brown, emits a peculiar smell, and at length becomes charred. If the serosity, after being evaporated to dryness, be digested in boiling water, it is re-dissolved, except a small quantity of flaky matter, which floats in it, and which seems incapable of solution. When the solid contents of the serosity, after having been evaporated, and reduced to a half charred state, are digested in boiling water, the fluid is rendered brown, and upon evaporation a brown mass is left, which contains small cubical crystals of the muriate of soda †. If

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* I suspect the generation of acid in serosity must be classed among those numerous occurrences, where the experimentalist has been guided more by hypothesis than by observation. When serosity had been announced to be a gelatinous fluid, it followed of course that it *must* evolve an acid during its spontaneous decomposition. See Brugmans as quoted in Thompson's Fourcroy, III. 272.

† It was always supposed that the muriatic acid in serum was combined with soda, until Dr. Pearson lately endeavoured to

prove

the evaporation of the serosity be stopped during the process, and the substance cooled, it does not exhibit any appearance of gelatinization. Acetate of lead and nitrate of silver both throw down copious precipitates from the serosity.

From these experiments we may conclude, that serosity consists of water holding in solution nearly $\frac{1}{50}$ of its weight of an animal substance, together with a small quantity of the muriate of soda. Of this animal matter a portion is albumen; the exact quantity cannot be ascertained, because it is not practicable to collect the precipitate which is occasioned by boiling the serosity with the oxymuriate of mercury; but from comparing the effects with what takes place, when a known quantity of albumen ovi is added to water, we may conclude, that the serosity cannot contain more than $\frac{1}{1000}$ of its weight of albumen. That the remaining animal matter in serosity is not jelly, may be at once inferred from the consideration, that if water contains only $\frac{1}{100}$ of its weight of jelly, it becomes concrete at the usual temperature of the atmosphere, whereas the serosity is perfectly fluid, although the animal matter in it is not much less than double

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prove it to be potash. My experiments induce me to adhere to the old opinion, as I never found the cubical crystals mentioned above to produce any precipitate with the nitro-muriate of platina. The addition of oxalic acid to serum shews that it contains a minute quantity of lime, and it is said that the phosphate of soda also exists in it.

that quantity. In order to ascertain whether there was any portion of jelly in serosity, the following experiments were tried. To a quantity of serum $\frac{1}{100}$ of its weight of jelly, liquefied by heat, was added, and upon cooling the mixture, it became quite concrete. To 94 grs. of serosity, 6 grs. of a solution of jelly, containing $\frac{1}{10}$ of a grain of solid jelly, was added, so that the jelly would form $\frac{1}{1000}$ part of the weight of the whole fluid. This was exposed to a gentle heat, and when it was nearly evaporated, upon being cooled, a very obvious degree of gelatinization took place. One fact still remained to be explained, which seemed to be the only one that opposed my conclusion, and this was the effect of tan on the serosity. The precipitate that is produced when tan is added to serosity, has always been supposed to indicate the presence of jelly [*]; but tan, although it does not detect albumen as minutely as it does jelly, yet it produces an obvious effect in a fluid that contains only $\frac{1}{1000}$ of its weight of albumen [†]. To prove that the action of tan on serosity depends upon the small quantity of albumen still remaining in it, a portion of serum was diluted with 4 times its bulk of water, to this was added $\frac{1}{8}$ of its bulk of a saturated solution of the oxymuriate of mercury, and the mixture was kept for some time at the boiling temperature; a hard dense precipitate was formed, the fluid was left transparent, and now it produced no precipitate with the solution of tan. Against this experiment it might be urged, that although the oxymuriate of mercury has no action upon jelly alone, yet that when a small quantity of jelly is united to a large proportion of albumen, the compound may be precipitated by the oxymuriate. To examine how far this objection was valid, I added to a portion of serum about $\frac{1}{100}$ of its weight of jelly, and then boiled it with the oxymuriate of mercury. A precipitate was formed of the usual appearance; but as the fluid cooled, the jelly formed a distinct concretion, and did not appear to have been incorporated with the albumen, or affected by the oxymuriate of mercury. There was another obvious difference between the precipitates formed by tan in serosity and in jelly; the precipitate in the serosity is incoherent, it subsides very slowly, and can scarcely be separated from the fluid by a filtre, whereas the precipitate in a solution of jelly of the same strength is a hard dense substance, which almost immediately separates from the fluid, and may be collected in a distinct mass.

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[*] In the most recent analysis of animal fluids, it has been assumed as a sufficient proof of the presence of jelly, that a precipitate is produced by tan. From this circumstance alone M. Nicolas concludes that the aqueous humor of the eye contains jelly. Ann. Chim. T. LIII. p. 310.

[†] If to a quantity of water $\frac{1}{120}$ of its bulk of serum be added, we shall have a mixture which contains about $\frac{1}{1000}$ of its weight of solid albumen. Equal parts of this mixture and the infusion of rhatany being added together, produce an immediate and very perceptible precipitation.

Conceiving it to be sufficiently established, that there is no jelly in serosity, the next object of inquiry was, whether the opinion be correct, that only a small part of the animal matter in it is albumen. For this purpose I examined the effects produced by the same re-agents upon serosity, and upon serum diluted with water, until its solid contents were equal, or even inferior in quantity to those of the serosity. A quantity of serum, which contained twelve per cent. of solid matter, was diluted with eleven times its bulk of water, so that its solid contents would be considerably less than that of the serosity, and the following comparative experiments were then performed. A boiling heat produced in the diluted serum a perceptible opacity, but in the serosity no effect. The same quantity of oxymuriate of mercury was added to both these fluids, it produced an evident precipitate in the diluted serum, but none in the serosity; when the boiling heat was applied to the two portions of fluid containing the oxymuriate of mercury, it produced in the diluted serum a distinct precipitate, which separated from the fluid and subsided; in the serosity there was a degree of opacity produced, but no distinct precipitate was formed. Even when this serum was still farther diluted, with three times its bulk of water, so that its solid contents could not have been $\frac{1}{6}$ as much as those of the serosity, the joint effects of heat and the oxymuriate of mercury caused a greater degree of opacity. And there is a still more decided fact in favour of my opinion. If serum be boiled with such a quantity of the oxymuriate of mercury as to remove all the albumen, and to leave a slight excess of the oxymuriate, the least addition of albumen will cause a fresh precipitate; yet if the fluid be evaporated, a residuum is procured, which is evidently in part animal matter. I have noticed a difference between albumen and the animal matter in serosity with respect to their solubility in water. Coagulated albumen is perfectly insoluble, as is proved by the constitution of the serum, and if albumen be very slowly evaporated by a heat not sufficient to coagulate it, it is capable of being redissolved, whereas if it be dried by a heat in any considerable degree greater than that necessary for coagulation, it remains insoluble in water. As far as I have been able to ascertain the fact, with respect to the animal matter in serosity, it does not possess the property of being equally insoluble by being exposed to the same degree of heat. When serosity has been evaporated, the whole is not again soluble; but the insoluble portion I attribute to some remains of albumen, which we have been led, from other circumstances, to conclude still exists in it. The greater part however is soluble, and remains so even when the heat applied has been considerable enough to produce a commencement of carbonization. These facts I consider sufficient to warrant the conclusion, that the greatest part of the animal matter in serosity is not albumen. I shall not at present inquire into its properties, or into the denomination which ought to be applied to it, as I propose to enter more fully into this investigation on some future opportunity. I shall conclude this paper with some detached observations respecting the serum.

The specific gravity of serum is generally stated at 1.027 or 1.028*, the original authority for which appears to have been Jurin; I have examined several specimens, and have always found it to be less; the average of my experiments is about 1.023. The proportion of the solid contents of the serum to the watery part, varies less than might have been supposed, from the varieties that we observe in the state of the blood. I have generally found the solid contents left by a slow evaporation to be pretty exactly 12 per cent.

Serum always exhibits marks of an uncombined alkali, the amount of which I have endeavoured to ascertain. After observing the effect that was produced by serum upon turmeric paper, I added a solution of potash, drop by drop, to a quantity of water, until it seemed to tinge the paper in an equal degree, when it was found that about $\frac{1}{1000}$ of its weight of the solution had been added to the water. The strength of the alkaline solution was such, that it was saturated by half its weight of sulphuric acid of the specific gravity of 1.76. To 240 grains of serum acetic acid was added, until there was a very slight excess of acidity; then to an equal bulk of water the same proportion of the alkaline solution was added, as was indicated by the last experiment, when it was found, that as much acetic acid was necessary to saturate this water as the 240 grains of serum. From these two experiments it appeared, that one ounce of the serum required for its saturation, as nearly as possible, one grain of the sulphuric acid. Acetic acid, 100 parts of which require for saturation 43 parts of pure potash, will cause an evident excess of acidity in 60 times its bulk of serum.

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* See the Systems of Thompson and Murray, Henry's Epitome, and Aikin's and Parr's Dictionary.

It is generally supposed that the alkali in serum is in the caustic state, and the following experiments seem to favour this opinion; although it must be acknowledged, that the smallness of the quantity renders it difficult to speak with absolute certainty upon the subject. To a quantity of serum acetic acid was added, until there was a slight excess of acidity, but no effervescence could be observed. To another portion of serum, about $\frac{1}{100}$ of its weight of a solution of a carbonated alkali was added, and this was then supersaturated with acetic acid, when a number of very minute bubbles might be discerned rising through the fluid. A solution of jelly was formed of about the same degree of viscidity with serum, and to this a solution of the carbonate of potash was added, so as to make it equally alkaline; when this was neutralized by acetic acid, an obvious effervescence was excited. As far as I could come to any certain conclusion respecting a point of so much minuteness, it did not appear that the alkali of serum became carbonated by being exposed to the atmosphere for a considerable length of time. Notwithstanding the alkalescency of the serum, the serosity scarcely ever exhibits any decisive marks of an uncombined alkali *.

In the experiments upon the serosity I have assumed, that its solid contents principally consist of animal matter; there are, however, some saline substances in it, and it was important to ascertain the proportion which they bore to the whole. For this purpose a quantity of coagulated serum was cut into small pieces, and boiled with successive portions of water, until all the soluble matter seemed to be separated from it; these different portions of water, were then evaporated, and the residuum was dried by a heat sufficient to reduce it to a half charred state. It was then digested in hot water, the fluid filtered, and again evaporated. The water

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* I speak of the serosity in its entire state, as procured in the manner mentioned in the beginning of this paper. When a considerable part of it has been evaporated, the residue I have found to be alkaline. We must therefore suppose, that there exists in serosity a very minute quantity of alkali, but commonly too little to be detected by turmeric: it must be less than $\frac{1}{2000}$ of its weight, considerably less than that in the serum from which the serosity is procured.

was tinged brown, and as the evaporation proceeded, evidently shewed that it contained a considerable proportion of animal matter. At length small cubical crystals were formed, which, when purified by a subsequent solution and crystallization, were found to be nearly in the proportion of 1½ grain in one ounce of the entire serum.

The most remarkable and characteristic property of albumen is its coagulation by heat, and by different chemical substances, particularly by alcohol and by acids. No explanation of this phenomenon has been offered which appears to me satisfactory, nor indeed does it seem easy to refer the operation of such different agents to any one principle. The hypothesis, which is by far the most ingenious, and which, from the authority of its supporters, claims every attention, was originally proposed by Dr. Thompson *, and afterwards more fully developed by Mr. Brande†. Mr. Brande adopted it in consequence of his discovery, that the negative extremity of the Galvanic apparatus has the power of coagulating albumen, an effect which he explains upon the principle, that the action consists simply in the abstraction of an alkali, which was before in combination with the albumen, and which preserved it in the liquid state. Uncoagulated albumen he therefore considers as essentially an alkaline solution, and that heat acts by causing some new disposition of the affinities, in

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* Chemistry, v. 489. † Phil. Trans. 1809. p. 373.

consequence of which the alkali is transferred from the albumen to the water. Alcohol and the acids, he supposes, in like manner, produce their effect by combining with the alkali. But to this hypothesis there are, I conceive, insuperable objections. In the first place, although it is admitted that alkalies possess the property of dissolving albumen, yet for this purpose a quantity is necessary, very much greater than what we have reason to suppose exists in serum. If the affinities are so nicely balanced in the serum, that the mere application of heat can separate the alkali from the albumen, much more would it permit itself to be displaced by an acid, so that when a quantity of acid has been added, sufficient to produce an excess of acidity in the serum, we must conclude, that all the alkali has been neutralized. The above experiments shew how very minute this quantity of alkali is, and how totally inadequate to produce the effects assigned to it. That the mere removal of the alkali from the albumen does not cause its coagulation, I think may be concluded from the fact, that acetic acid may be added to the albumen in more than 100 times the quantity necessary for saturation, without any appearance of coagulation taking place. This seems to prove, that coagulation does not depend merely upon the abstraction of the alkali, and, I confess, appears to me quite decisive against the hypothesis of Mr. Brande. At the same time I acknowledge myself unable to substitute any other in its place, and therefore I content myself at present with expressing the fact;

that the action of heat upon albumen is specific, unlike any other phenomenon, with which we are acquainted, and not capable of being referred to any general principle.

The operation of alcohol upon albumen I conceive to depend, in a great measure at least, upon its power of abstracting water from it. This opinion I ground upon the following circumstances: when albumen is only moderately diluted, the effect of this re-agent is greatly diminished, or even altogether destroyed. If we dilute serum with six times its bulk of water, the effect of alcohol is scarcely perceptible, while oxymuriate of mercury converts the fluid into a thick cream. If alcohol be poured into serum, its superior levity keeps it on the surface, and it immediately produces a coagulation in the upper stratum of the albumen; but if a quantity of water be added, the coagulum is instantly removed; and the same may be effected by exposing it to a gentle heat, when the alcohol is evaporated, and the serum is left in the same state as before the experiment. This circumstance proves that albumen, as coagulated by heat, is a very different substance from the coagulum that is formed by alcohol, and from this difference in the result we may infer that the processes themselves are different in their nature.

The coagulation of albumen by sulphuric acid must, I conceive, likewise be referred, in some measure, to its affinity for water, because in this case, as in that of alcohol, if the serum be considerably diluted, it quickly loses the property of being coagulated by the acid, and a coagulum which has been formed may be re-dissolved, by the addition of a considerable quantity of water. If the serum be diluted with six times its bulk of water, no immediate effect takes place from the addition of sulphuric acid, and after serum has been coagulated by sulphuric acid, if a quantity of water be immediately added, and the mixture agitated, the coagulum is entirely re-dissolved, and the fluid is rendered transparent; but although the first effect of the acid be owing to the sudden abstraction of the watery part of the serum, yet it seems that afterwards a union takes place between the acid and the albumen, for even in serum that is considerably diluted, a coagulum is gradually produced which is insoluble.

The oxymuriate of mercury has been classed among the substances which coagulate albumen; yet, strictly speaking, I should regard it rather as a precipitant than as a coagulator. It enters into a chemical union with albumen, and forms an insoluble substance which subsides from the fluid; it even acts so powerfully, as that when it is added to albumen, and heat is afterwards applied, it destroys the coagulum which would otherwise be formed, and entirely separates the water from the solid part of the serum. The following experiment is, I think, a decided proof that the oxymuriate of mercury forms a real chemical union with albumen. The oxymuriate was added to serum in such proportion as to separate all the albumen, and to leave the fluid transparent; an equal bulk of water had the same quantity of oxymuriate added, and to equal measures of this solution, and of the fluid from the former experiment, the muriate of tin was added; in the fluid a turbidness was produced, and a small grey precipitate slowly subsided; in the solution a copious black precipitate was formed, which fell to the bottom in considerable quantity. An experiment of a similar kind was made with pure potash, by adding it in equal quantities to the solution of the oxymuriate of mercury, and to the fluid that was separated from a mixture of oxymuriate and serum. Although there was some variety as to the effects produced on different specimens of serum by the oxymuriate of mercury, yet generally it appeared, that if to a quantity of serum half its weight of a saturated solution of the oxymuriate of mercury was added, and the mixture boiled, the albumen was all separated, the fluid was left transparent, and was affected neither by the oxymuriate nor by serum, shewing that they had mutually saturated each other. The same circumstance, however, seemed to take place here, which had formerly been observed with respect to the compound of tan and jelly, that although there is one particular proportion in which the substances seem most disposed to unite, yet according to the quantities of each that are added together, a considerable variation is produced in the nature of the product. In a comparative experiment, which was made for the purpose of ascertaining this point, it was found, that when the same quantity of the oxymuriate of mercury was added to two portions of diluted serum, one containing only half as much albumen as the other, the weights of the precipitates were as 9 to 15. When dried by a moderate heat, the precipitate which contained the greater proportion of the oxymuriate was harder, and of a blacker colour than the other *.

The following conclusions may be deduced from the experiments that are detailed in this paper: 1. The serosity of the blood contains no jelly. 2. It contains a minute quantity of albumen. 3. It contains about 2 per cent. of solid contents; the chief part of which is an animal matter different both from jelly and albumen. 4. It contains a little muriate of soda, and probably also a minute quantity of uncombined alkali. 5. The animal matter peculiar to serosity is not affected either by the oxymuriate of mercury or by tan, and it is not, like albumen, rendered insoluble by heat. 6. The

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* The effect of the oxymuriate of mercury in coagulating serum appears to have been first discovered by Boyle. In the "Natural History of the blood," he relates the following experiment: "To "try also what a salt compounded with a metal would do upon "our serum, we put to it a little strong solution of sublimate "with which it presently afforded a white and curdy substance."

specific gravity of serum is generally not more than 1.023. 7. Its solid contents are generally about 12 per cent. 8. The quantity of uncombined alkali in one ounce of serum is saturated by one grain of sulphuric acid. 9. The alkali is in the caustic state. 10. Serum contains about $\frac{1}{60}$ of its weight of the muriate of soda. 11. It is probable the coagulation of albumen by heat does not depend upon any chemical change in the relation of the alkali to the albumen. 12. It is probable that alcohol coagulates albumen principally by the sudden abstraction of water from it. 13. Sulphuric acid acts partly on the same principle, but partly also from a chemical union between the acid and the albumen. 14. The oxymuriate of mercury acts by forming a chemical compound with the albumen which is insoluble in water. 15. The compound of the oxymuriate of mercury and albumen is not uniform in the proportion of its constituents.

ON
THE MERCURIAL PLAN
OF
TREATMENT IN DYSENTERY;

WITH

OBSERVATIONS ON THE SAME PRACTICE AS APPLIED TO YELLOW FEVER, AND TO THE REMITTING FEVERS WHICH OFTEN OCCUR IN EUROPE, AS WELL AS IN THE EAST AND WEST INDIES.

BY WILLIAM FERGUSON, ESQ.

INSPECTOR GENERAL OF HOSPITALS TO THE ARMY IN PORTUGAL

COMMUNICATED

BY DR. MARCET, FOR. SEC. &C.

Read Jan. 16, 1810.

THE following paper was originally communicated to the Society in the form of a private letter, without any authority to publish it; but having been sent back to the author in Portugal, with a request that he would allow it to be published in the Society's Transactions, with whatever corrections or additions his subsequent experience might suggest, the original document was speedily returned by Mr. Ferguson, accompanied by a letter, of which the following is an extract:

Lisbon, May 20, 1811.

" *I now return the paper, with full permission to*
" *make whatever use of it the Society may think*
" *proper. I do not give this permission lightly,*
" *for I have revolved and reconsidered its contents*
" *with all my strength; and really find, that every*
" *opinion it contains, so far from being changed,*
" *has been gaining additional confirmation ever since*
" *I wrote it. In a postscript will be found an ex-*
" *tract of a letter from Dr. Gray, Physician to the*
" *forces; who has been travelling over the same*
" *field of military practice as myself, for an equal*
" *number of years (now eighteen), only he has had*
" *the advantage, which I never enjoyed, of spending*
" *a considerable time in the East Indies. He de-*
" *cidedly concurs in the propriety of mercurial*
" *remedies for Dysentery; and in a late publica-*
" *tion by Dr. Gourlay, on the Climate and Diseases*
" *of Madeira, there is a decisive testimony in fa-*
" *vour of the mercurial practice.*"

Portsmouth, November 12, 1809

. . . .

. . . . It is only within a short time, and during the late campaigns in Portugal and Spain, that I have had recourse so frequently to mercury. I confess myself to be partial to its use, though I may indeed have pushed it beyond the mark. The universal epidemic that there prevailed among every description of military in the field, was Dysentery. This, when mild, admitted of an easy cure, by acting on the bowels with mild purgatives, and keeping up their action steadily, but not violently, for a few days. It was cured with nearly the same facility by acting upon the skin without purgatives, through the influence of active diaphoretics. In this way every regimental surgeon, looking to the number of recoveries from his sick list, believed that he possessed a cure for the disease, whether he followed the one or the other mode of treatment. The attack, however, sometimes began with such urgent and violent symptoms, that a power beyond either of these two, became necessary to save the patient; irreparable mischief otherwise ensued, from the violent inflammation, followed by ulceration and thickening of the colon and larger intestines; and the patient, if he survived the acute attack, sunk afterwards a miserable victim of chronic disease. It is probably this form alone, of which I sustained two very severe attacks, that deserves the name of true acute Dysentery; the others were local diseases of the lower intestines, in which the general system was little affected, or did not at all sympathise. In the aggravated form, there appeared one never-failing symptom which always served me as a guide and diagnostic. The urine was high-coloured, even green, scanty, and pungent; and though there were no other discoverable signs of hepatic affection, this was my signal for beginning and pushing the use of mercurial remedies. Half a grain of Calomel, with one grain of Ipecacuan, was given every hour. This never aggravated the abdominal pains; on the contrary, appeared to alleviate them; or, if it did not, some mild saline purgative, or castor oil largely diluted with mucilage of gum arabic, gave ease, and permitted the continuance of the mercury till the gums were affected. This generally took place in 48 hours, when a solution of the disease might be looked for with confidence; and of which one of the most certain precursors was the urine resuming its natural condition. In a few cases, and really in a very few, the disease did not yield after the mouth became sore; and these were then found to be of an obstinate and incurable nature. I had few opportunities of seeing patients of that description, but those that came under my view were elderly soldiers, who, from former abuse of spirituous liquors, might be supposed to labour under previously obstructed viscera. In others, again, the use of mercury was neglected, and the patient died: The dissection then exhibited a miserable mass of disease in the great intestines. The colon, its descending portion particularly, being thickened, knotted and ulcerated to an inconceivable degree. The smaller intestines shewed little or nothing of these appearances, and we often lost even the traces of disease, till we came to the liver, which uniformly was blackish, hard and wasted; the gall-bladder flaccid, and about half full of thin watery bile.

I had an early and painful lesson in the mercurial practice; for in preparing to land in Portugal with Sir John Moore's army, and being exposed to the night dews on the water after a dreadfully hot and fatiguing day of preparation, I was attacked suddenly and violently with Dysentery. Purgatives gave only a momentary relief, and notwithstanding the fair trial of other approved remedies, the complaint continued unabated, and in three days I was reduced to extremity. A friend enjoined the immediate use of Calomel in grain doses. I had before taken one or two large doses as purgatives, which probably quickened the effect; for in about 15 hours, I perceived the coppery taste in my mouth, and from that moment I may say, I felt that the disease was gone: my spirits and appetite revived, and I no longer thought of dying.

I need not say, that this early lesson was an instructive one. The whole army was more or less dysenterically affected, but by administering mild diluted purgatives to the slighter cases, and boldly mercurialising, even by inunction, which I believe to be the best practice, the severest, the deaths from the disease, in the regimental hospitals, where the greater part of the sick were treated, scarcely exceeded one in 200. Many of these were of course trifling, but all were Dysenteries; and shewed the diagnostic symptoms of tenesmus and of mucous evacuations without any admixture of bile or fæces. In some the disease might be said to be entirely local, and confined to the lower part of the intestinal canal. The patient felt no constitutional disturbance, and could do his duty; but was troubled with an irritation, like that from ascarides, about the rectum; to which, if he yielded, the irritation was increased, with frequent, scanty, mucous stools, and tenesmus. My direction was always, if possible, to resist the inclination, to enforce the passage of the natural fæces, at least once a day, by some purgative, and to wear a broad flannel roller swathed round the whole of the abdomen: this often succeeded without confinement.

It may strike you as strange, that in almost every stage of the acute disease, I considered opium to be hurtful, and even dangerous. The temporary ease which it afforded from the tormina of the bowels, was generally succeeded by worse symptoms; and besides, the same degree of relief was much more effectually obtained by mild purgatives, which were otherwise productive of permanent benefit. Astringents of every kind, during the acute stage, were even worse than opium. When the excessively acrid discharge that came from the bowels was examined, it was easily to be seen, that it could not be locked up in the intestines with impunity, and that the patient could only expect to be easy from having its exit facilitated. During convalescence, and when the natural passage of the fæces was restored, there could be no objection to the use of any of the tonics and astringents; but amongst these opium held no place.

From all these facts, I came to an early conclusion, that though it was little discoverable from any symptom but the condition of the urine, yet that we were to look to the liver principally, for the source of the disease. The apparent seat of the complaint was to be seen in the intestines themselves; and the action of purgatives upon them may be supposed sufficient to change the diseased, and to induce a new action; but still the grand organ of the bile was to be specifically stimulated, and its ducts steadily emulged, and duly opened by the operation of mercury, before a cure could be expected.

Dysentery, from my experience of it in Holland, the West Indies, and South of Europe, I believe I can declare to be in no case contagious. I never saw any thing like it, except in Holland, after the weather became cold, when it was seen as a symptom or irregular local form of typhous fever; but more could not then be said, than that it was about to be swallowed up in the prevailing epidemic, and formed a combination, rather than a distinct type of disease.

True dysentery is the offspring of heat and moisture; of moist cold in any shape after excessive heat: nothing that a man can possibly eat or drink would ever give him true dysentery. A chill from dry cold air would produce a different affection; but the more penetrating forms of moisture, such as lying on damp ground in the hot season, or being exposed to the night dews, or to a stream of chilling exhalations after violent rains, when the system has been relaxed by previous heat, seldom fail to bring it on. Marsh miasma would beget fevers of its own generic type, and moist cold alone, not preceded by heat, would manifest its action by inducing rheumatic, pneumonic, or catarrhal fever, according to circumstances. I know not, whether the ascertained indispensability of previous heat in the production of dysentery, will be admitted as a proof of the hepatic system always participating in, and being, in fact, a seat of the primary symptoms. Certain it is, however, from the state of the urine, that there must at least be spasm, or collapse and inaction of the biliary ducts; and the wasted appearance of the liver, far beyond what could be expected from general constitutional exhaustion, gives countenance to the supposition of its functions having been disordered and impeded.

There is another disease, happily for this country little known amongst us, where mercury, not empirically used, but duly applied at the proper stage and period, I hold to be a great, and probably the *only* remedy upon which much reliance is to be placed—I mean the remittent fever, which rages throughout the world, wherever a marshy surface is exposed for a sufficient length of time to a powerful sun. It is by far the most universal of all the forms of fever, and whether it comes out an ague from the fens of Lincolnshire, the endemic remittent (commonly called the yellow fever) of the West, or the Jungle or Puckah fever of the East Indies, it is only a modification of effect from the same cause. Its mode of invasion constitutes at once its decided difference from our typhous fever. In typhus, the symptoms insidiously creep upon the patient; but in remittent fever the attack is at once powerful and decided, and all the powers of the system appear to be called into action against the newly applied poison. We cannot know whether this increased action (commonly called re-action) becomes, from its violence, dangerous to life, or whether the unsubdued power of the original cause finishes the work of destruction; but we know that the whirl and hurry of the circulation, if not moderated by artificial means, soon terminates in deposition upon, or determination to, some of the important vital organs, to the large abdominal viscera of the liver and spleen, more particularly the first. In hot climates, this determination is generally fatal; but in the remittent fever of Europe, more particularly that of Holland, it is often the commencement of chronic, irregular fever, with imperfect convalescence, and frequent relapses; from which (the acute symptoms being past) at first little danger is apprehended. Our practice should be regulated accordingly. Mercury, during the violence of the first symptoms, would in all probability have done mischief, by increasing the effects of general stimulation: but in the second stage it must, from its known qualities, have powerful effects in rendering pervious the obstructed viscera: without it, I believe that tonics and stimulants would only do harm, by rousing the system into undue efforts, from which it must sink exhausted; but duly combined the vital powers may be made to go hand in hand with the artificial action of the mercury. The liver, being the first object of congestion and determination, it might appear good practice, while the general invasion is kept in check by the vigorous means of depletion and refrigeration from without, to use calomel for the purpose of keeping open and emulging its inner emunctories; but I conceive this method would be too tedious to serve any good purpose, and that the treatment at the beginning ought to be purely and generally antiphlogistic.

A question may here arise, respecting the propriety and extent of venesection. When used early, and before determination has been marked, I hold it to be the most powerful means of preventing the bad consequences that may otherwise be expected to ensue. It ought, therefore, in the young sanguineous soldier, to be generally and decidedly practised, on the first invasion. If it has no other good effect, it will, at least for a time, enable the practitioner to hold the reins, and render the system more amenable to the action of remedies, more particularly sudorifics; but if delayed till congestion has taken place, it will then enfeeble the vital powers, and diminish the means and chances of the obstruction being overcome*.

The application of cold under any chance or suspicion of obstructed viscera, may form another question, but it can never surely be unsafe to diminish accumulated heat by any means not too violent; and though I should not fear to use the cold affusion, I doubt not that simple ablution or sponging would be perfectly effectual.

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* The superstitious disuse of the lancet at the beginning of soldiers' diseases, which are then almost always inflammatory, amounting almost to a proscription of the remedy, through the prejudice of the schools, and the false inferences deduced from its effects on the debilitated subjects of private life, has caused more deaths, or at least prevented more lives from being saved, than any other fault in military practice.

This chronic and irregular form of the Walcheren fever, is now treated at many of our military hospitals with success by mercurials only; and as the medical officers become enlightened by inspecting the bodies of those that die, I doubt not that it will become universal. It has been long my belief, that remittent fever does not endure many days without producing the effects above-mentioned. As in the yellow fever of the West Indies, the patient may die in this country from the violence of the general symptoms; but I believe that death is still more certainly and frequently induced, by determination to, and injury of, some vital organ. The liver, I am convinced, was there primarily and principally affected. The patient could not live till it suppurated and ruptured, but it was always enormously congested, and its secretions so changed that, in place of the natural balsamic bile, it appeared to distil poison into the intestines. When we opened the bodies, the gall-bladder was always found impacted with a black, tenacious, pitchy substance, as thick as common tar, and, at its communication with the intestines, they (the intestines) were in a state of low, erysipelatous, even semi-gangrenous inflammation. If we could suppose the albuginea of the eye in a jaundiced person to be in a state of inflammation, it would give the exact idea of their appearance. The patient seemed to die through the effect of incessant vomiting, the stomach was also found in a state of inflammation; but as this symptom seldom shewed itself, till the disease was considerably advanced, we may suppose that the stomach being sympathetically affected by the presence of this acrid bile in the neighbouring intestines, regurgitation was produced by nausea; and that thus the poison was first received into that viscus whence it could never be expelled, as every effort for that purpose produced an augmentation of the original quantity. Were the heat as great in Walcheren, we should no doubt find the liver as much a sufferer, and an *agent*, as at St. Domingo; for in Portugal, after the battle of Vimeira, I met with the purest cases of Yellow Fever, in some regiments encamped amongst marshes; and at Sheerness in Kent, during the autumnal heats of the year preceding, while I was the Inspector of the district, fevers occurred, which, for violence of symptoms, and strongly marked hepatic affection, might justly have been classed with West India diseases*. The defective sensibility of the liver,

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* The endemic remittent, though the most general, is not the only form of yellow fever; and the most dreadful mortality has ensued from that disease, where it was impossible even to suspect the agency of miasmata in any shape. In fact, all the young, the sanguineous, and robust, were its victims, and could not be saved from its attack, as long as they continued to possess European vigour, and until they had been relaxed by the climate, and entirely lost the rigidity of muscular fibre which they had brought

from

more particularly under disease, has for ages deluded the dying patient and his medical directors. It

from their own country. The invasion, progress, and termination of this type of fever, seemed to follow the same course as those of the endemic remittent, although it must have arisen from a different source, because it broke out where miasmata could not exist, and where exposure to the solar rays was most evidently the exciting cause. Amongst our unfortunate soldiers, intemperance, costiveness, plethora, youth, and the highest tone of muscular fibre, under every supposable excitement from the senses, all predisposed to disease, and prepared the human frame, as if it had been a combustible body, to be lighted up into fever by the torch of the sun. Why the solar rays do not exert a corresponding baleful influence on the sands of Egypt, or in other climates equally hot or hotter than the West Indies, or why the same effects were not felt even there to the same degree previous to the year 1793, is beyond our ken; and in all probability will never be discovered to us, any more than those other conditions and modifications of the atmosphere, which, independent of the qualities of soil, afflict us with influenzas and other epidemic diseases. When I first went to the West Indies, I had no doubts on the subject, because the contagious nature of Yellow Fever formed as much an article of my creed, as that of plague or small-pox does now; but I had been there only a very short time, when in spite of my prejudices, I was obliged to open my eyes to the irresistible conviction that broke in upon me from all quarters, of its not being capable of being propagated by contagion; and during the whole time that I remained in the country (several years) I never saw the smallest reason to alter that opinion. I do not pretend to say, that the punishment which is ordained against the undue accumulation of human effluvia, and neglect of ventilation in crowded ships, hospitals, or prisons, would not be manifested by the production of temporary pestilence in the West Indies, the same as in any other climate; but I fully believe, that the Yellow Fever, under ordinary circumstances of ventilation and cleanliness, is never contagious.

was the current belief, till lately that their eyes have been opened by freer communication with the East, that liver complaint never occurred in the *West* Indies; and while I was there, it was common for the practitioners to boast of their curing agues and dysenteries by mercury, without their having the smallest suspicion of the true source of the disease.

In the great field of military practice, I am not disposed to abandon my opinions in favour of mercury, notwithstanding that in private practice it may often be very empirically and absurdly resorted to. I have seen the same amongst ourselves in the West Indies, where some of the advocates for mercury, as if to save themselves the trouble of thinking, blindly and preposterously pushed its use under all circumstances.

I may conclude the recapitulation of my creed by saying, that in dysentery, I would use it to rouse from inanition, or inaction, the torpid liver, and restore to the smaller intestines their healthful bile; for without it they perform no duty, but permit the stricture on the larger ones to continue unresolved, and thereby run its course of obstruction and ulceration: and in remittent fever, when the violence of the acute stage has been past, I should equally depend on its specific stimulating power, to render pervious the obstructed viscera. Relapses would not then occur; for the axe will have been laid to the root of the evil; and in dysenteries cured by mercury, the same happy result may be expected to attend. Experience at least tells me so, as I have seen many a patient restored to vigorous health, with regular bowels, within a few weeks after having sustained an attack that might have been supposed to render him valetudinary for years. I have found few agents of much power in the Materia Medica; but mercury I hold to be one which, when skilfully wielded, may be applied to accomplish the most important purposes of medical practice; but exactly in the proportion that it is powerful, so is the danger of using it needlessly and improperly, or of committing its administration to unskilful hands; and I must own, that I have seen it commit sad havock even in dysentery, when prescribed for slight cases, and persisted in till it became difficult to distinguish between the disease and the mercurial action in the bowels.

WM. FERGUSSON.

(Postscript.)

Lisbon, May 20, 1811.

When the foregoing letter was sent out to me here about a month ago, for correction, preparatory to its appearing before the public, I shewed the contents to my friend Dr. Gray, who has favoured me with the following observations upon it, dated April 14, 1811.

"I have read your paper on dysentery with "much interest, from the striking coincidence in "your practical views with what has fallen under "my own observation, when with the army in "the East Indies, as well as in different parts of "Europe. Indeed I have also long been an ad- "vocate for the employment of mercury in dys- "entery, from ample proofs of its success both "in the acute and chronic stages, only delaying "its use in the former, till the milder modes of "treatment are either found inadequate, or the "disease assumes an alarming aspect. Experience, "however, has led me to trust chiefly to the in- "troduction of mercury into the system, by means "of friction, in the proportion of ʒi. of the strong "mercurial ointment twice, thrice, or even four "times in the day, according to the urgency of "the case, and carried the length of not merely "affecting the gums, but inducing ptyalism to "the extent of an English pint, or even more, "daily; which effect must be kept up for a week "or longer, if the disease do not give way, and "the patient's strength will bear it: and I can "safely 'aver, that, in this way, mercury has not "only very often succeeded after the failure of "every other remedy and mode of treatment that "could be devised, but has even rescued some "desperate cases, when no reasonable hope of re- "covery could be entertained. When the mouth "becomes what the patients term *very sore*, though "without much spitting, there is pretty generally

" an abatement of the dysenteric symptoms; but " the mercury requires to be pushed the length " mentioned, effectually to stop the disease. " Still it must not be imagined, that I have not " found mercury to fail in dysentery; for unfortunately the reverse is the fact. But I will venture to assert, that the mercurial plan, employed " before the organic mischief is irreparable, or the " debility and emaciation irrecoverable, affords " the most successful mode of treatment hitherto " employed; not merely in the inter-tropical dysentery, or rather hepatirrhœa, (when the acrid " biliary secretion, irritating, and eventually ulcerating the intestines, is often the first symptom of a diseased liver,) but also in dysentery, " as described by nosologists, and occurring during European campaigns; the symptoms of which " differ considerably from those of the former, " and in which I cannot help thinking that the " liver is seldom to be looked to for the source of " the disease. When the mercurial plan has failed, change of climate, when practicable, and " not delayed till the last extremity, sometimes " succeeds in bringing about recovery.

" I have thus briefly stated the result of what " I have seen and practised, in the treatment of " a disease, that often proves the scourge of armies; without indulging any conjectures on the " *modus operandi* of the remedy."

(Signed) J. GRAY.

" In regard to the treatment of this disease, " (says Dr. Gourlay) I hold it of the utmost consequence that the proximate cause, the peculiarly morbid inflammation of the intestines, be " constantly kept in view; for it appears from dissection, to be in every case directly or indirectly " the cause of death. That plan of cure then " ought to be the best, which forms its indications " from the view of removing this proximate cause. " According to this plan, to remove the peculiar " morbid inflammation, to unload the bowels, to " relieve uneasy symptoms, and to restore to the " intestines their healthy action, are the general " indications to be formed. The best and most " effectual means of answering at once all these " indications, according to my experience, is the " use of calomel alone. This medicine, exhibited " in doses of six, eight, or ten grains, repeated " at intervals, determined in their length of time " by the previous effects of its action, and the " other circumstances of the patient, has been uniformly found to unload the bowels, and to keep " them open; to relieve the uneasy symptoms of " tormina and tenesmus, and even of vomiting, " if present; to raise the pulse, and remove that " languid look and general depression, so constantly attendant on this disease. To judge " from these effects, the probability is, that it also " operates in some peculiar way; in a way, perhaps, analogous to its mode of action, when " applied externally to an ill-conditioned ulcer,

" upon the morbid inflammation of the intestines, " so as to remove it. In regard to astringents " and opiates, I have seldom found occasion for " such articles, unless where the free evacuation " of the intestines was neglected in the first instance, or large doses of such debilitating cathartics as aloes, colocynth, jalap, rhubarb, or " glysters containing acrid materials, had been " administered for this purpose. Indeed I have " found calomel to be not only the best remedy " in the beginning, for unloading the bowels, and " relieving uneasy symptoms, but also in the latter stage, to be the best and softest anodyne." Observations on the Natural History, Climate, and Diseases of Madeira, during a period of eighteen years. By Wm. Gourlay, Fellow of the Royal College of Physicians, Edinburgh, and Physician to the British Factory at Madeira. London, 1811, 8vo. p. 135, 136.

A CASE
OF
LITHOTOMY,
WITH
REMARKS ON THE EFFECT OF THAT OPERATION,
AND ON
SOME CASES OF FISTULÆ IN PERINÆO.

BY THOMAS CHEVALIER, ESQ. F.L.S.
SURGEON EXTRAORDINARY TO THE PRINCE REGENT; AND SURGEON TO THE WESTMINSTER GENERAL DISPENSARY.

Read March 26, 1811.

I AM induced to lay an account of the following case before the Society, not more from the particular circumstances which the history of it is intended to record, than from the confirmation it affords of the late Dr. Austin's theory, respecting the formation and growth of stones in the urinary bladder.

Nathaniel Martin, aged 59, a stout and rather corpulent man, consulted me at the end of November, 1807, on account of extreme pain in passing his urine, with frequent provocation to void it, attended with the discharge of large quantities of mucus from the bladder. He informed me that he had several years before been attacked with dysury, and inflammation in the perineum, which had been followed by an abscess. The abscess healed, but the symptoms of irritation in the bladder remained, and had continued to increase.

I introduced a sound, and feeling a stone very distinctly, I did not hesitate to propose the operation, as there were no circumstances existing which appeared to me to render it unadviseable.

I performed it on the 9th of December, and extracted two stones of moderate size. He slept better that night than he had done for many months, and every thing appeared to go on favourably till the end of the second week, when I of course expected the urine would begin to pass through the urethra. The wound had constantly looked well, and was gradually closing. He was at this time attacked with a violent diarrhœa, and in a few days began to complain of pains resembling those he had experienced before the operation, and they soon became equally severe. The urine did not now continue to flow away constantly, but when a small quantity was collected in the bladder, he felt a desire to pass it, and after a severe pang, which extended along the urethra, it was discharged through the wound, and when it could be collected in a vessel, the same mucus, though much less in quantity, was found at the bottom as formerly. I had been very particular in my examination of the bladder after the operation, and had injected two large syringe-fulls of water to clear it perfectly, and therefore I was convinced no particle of stone had been left there. But as he complained of some pains in his back as well as in his bladder, I at first thought it not improbable that some small calculus had descended from one of the kidneys, and had blocked up the wound. I therefore introduced a long probe curved, through the wound, and examined it and the bladder with the utmost care. At the superior part of the incision, the probe seemed to touch particles of a gritty matter, but nothing whatever could be discovered within the bladder itself. These embarrassing circumstances were however soon explained; for in two or three days there began to be discharged through the wound, a soft kind of paste, made up of a white sabulous substance, and mucus, of which a considerable quantity was, from time to time, collected upon the dressings. He then complained of much pain in the penis, and on examining this, the urethra was found completely choked up with the same substance *, but harder, of which some was taken out from time to time by a convenient instrument, as it appeared to be forced forward by every effort to make

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* Dr. Wollaston has been so good as to analyse the matter voided by the patient, and finds it to be principally a remnant of a coagulum of blood, surrounded, as might be expected, by a medley of those concretions which usually form on any substance retained in the bladder; viz. Triple phosphat of magnesia, phosphat of lime, and uric acid.

water. At length, after several weeks spent in this manner, it ceased to be discharged, the urine then came freely through the urethra, the wound in the perineum completely healed, all symptoms of irritation went off, and he has had no return of them to the time I am now writing this paper, (January, 1811.)

Prior to the discharge of this sandy substance, I endeavoured to relieve his pain by opiates chiefly; but when that appeared, and the diarrhœa had subsided, I ordered him the muriatic acid, with tincture of opium, first in water, and afterwards in an infusion of the uva ursi. He continued the use of the acid to the end of January. How far it might contribute to his relief I cannot say, but he thought it gave him ease, and it seemed to have a beneficial effect upon his general health.

It will be recollected to have been the opinion of Dr. Austin, deduced from a variety of experiments, that the matter composing calculi, is a deposit, furnished chiefly from the mucus secreted by the internal coat of those organs through which the urine passes; and that, therefore, this fluid contributes much less to their formation and growth in the bladder, than had been generally supposed.

The quantity of mucus, which is frequently discharged with the urine of calculous patients, is, therefore, to be considered both as a cause, and an effect, of increase in the size of a stone. The stone, by its asperity, irritating the internal coat of the bladder, and exciting an excessive secretion of mucus; the mucus, on the other hand, affording an increased supply of calculous matter to crystallize upon the stone, and augment its bulk.

It is therefore probable, that a considerable quantity of calculous or sabulous matter may sometimes be supplied in a short time, when from any cause, after the extraction of a calculus, as well as under any other circumstances, the bladder is thrown into a state of irritation.

In the case I have related, this appears most evidently to have been the case. The secretion of mucus, to which the bladder had been accustomed, ceased soon after the operation; but was again renewed, in consequence of the irritation produced upon the wounded bladder by an almost incessant diarrhœa. At first it was carried off with the urine as fast as it was secreted, and therefore no time was allowed for the sandy matter to crystallize from it; but when the wound became so nearly closed, that the bladder began to retain the urine, and of course the mucus, it was separated in considerable quantity, but was still carried off, with the mucus, in this paste-like substance, partly through the wound, and partly through the urethra. At length the secretion of this depraved mucus ceased, and all the symptoms accompanying it consequently disappeared. But, had it continued much longer, there can be little doubt that a new calculus would have formed, and a repetition of the operation would have become necessary.

It is a curious fact, which, before Dr. Austin's publication, was never explained, that a great majority of those persons who have undergone the operation of lithotomy, and have recovered, have remained free from the disease during the remainder of their lives. Some change must, therefore, have been produced in the organs secreting the fluid, whatever it be, from which the materials composing calculi are supplied. That such a change should be induced on the kidneys, seems much less probable than that it should take place in the bladder itself, on which the operation is immediately performed.

The *kidneys* continue their office after the operation, as well as before; and their experiencing little or no interruption in so doing, is always considered as a favourable omen with regard to the event. It is evident, however, that the functions of the *bladder* entirely *cease* for a time; and that it enjoys, if I may so express myself, a state of absolute rest from its duties, during the whole interval which elapses between the period of the operation, and that in which the union of the wound is so far completed, as to allow the urine to accumulate in it. It then resumes its offices, both as a reservoir, and an evacuator of that fluid; but it resumes them only gradually, for the quantity it retains is at first but small, and of this a part is usually for some days discharged through the wound, and a part only through the urethra; at first with short, and afterward with longer intervals between each evacuation.

To this state of rest, and suspension of every former source of irritation, more than to any other of the causes hinted at by Dr. Austin, I am disposed to ascribe that favourable change in the secreting surface of the internal coat of the bladder; in consequence of which, supplying afterward only healthy mucus, and this but in due proportion, the future formation of calculi, so far, at least, as it arises from superabundant, or depraved mucus, will of course be prevented.

That some cases should occur in which the bladder retains a considerable degree of the irritability it had acquired before the operation, so that the secretion of this mucus should continue, and calculous matter be again deposited; and that, in other cases, this irritability should be revived by the descent of new stony concretions from the kidney, which speedily become too large to be transmitted along the urethra, and thus re-produce the disease, cannot appear wonderful. It is rather surprising, that the proportion of such cases is not much greater than we really find it. It may also justly appear surprising, that the irritability of the bladder should not, in some cases, be *augmented* by the wound it receives in the operation. This is extremely rare in those cases where the patient recovers: when, as is sometimes unfortunately the case, the bladder, instead of feeling more relieved by the removal of the stone, than injured by the wound made in the operation, takes on a high degree of increased irritation: this usually commences almost from the moment of the operation, and the case is likely to terminate fatally. But if the alarming symptoms subside, and the patient afterward recovers, the bladder returns to as tranquil a state as if they had not occurred; which they are most apt to do when the patient, at the time of the operation, is in other respects in a state of high health and vigour, and the constitution has been but little affected by the disease.

The state of the bladder, however, which these symptoms denote, is not a state of mere inflammation of that organ, and is also to be distinguished from an attack of peritonitis. It appears much to depend on the shock given to the nervous system in the operation, and communicated to every part of the body; but of which the bladder, from its wounded, and previously morbid state, partakes more than any other. On the dissection of such cases, the local inflammation has sometimes been found to be slight; but it is well known, that the influence of any important, and, sometimes, even of a comparatively unimportant accident, or operation, is such, as frequently to derange the whole nervous system in a similar manner, and, for a time, to disturb every function, and deprave every secretion, in the animal economy.

That, however, an attack of common inflammation of the bladder may sometimes prove ultimately beneficial, by destroying a state of previous morbid action, the following case renders highly probable.

George Hunter, a boy about ten years of age, had frequent obstructions to the passage of his urine, by small cysts, or rather concave films, of an opake membranous appearance, which were afterwards voided. As his fits of pain were sometimes severe, it was thought highly probable there might be a stone in the bladder; and, under this impression, he had been repeatedly sounded by my judicious friend, the late Mr. Ford, but without any calculus having been discovered. When I succeeded that gentleman, as Surgeon to the Westminster, General Dispensary, where the boy had been received as a patient, he came of course under my care. Shortly afterwards he was attacked with a severe fit of dysury, which was followed by violent inflammation of the bladder. It was necessary to draw off his urine from time to time, which contained a considerable quantity of purulent matter. On one occasion, when I had introduced an elastic gum catheter, I felt distinctly what appeared to me to be a stone: it was also felt by one of my pupils, who was with me, and by the boy's father, who, on hearing me say I had found a stone, wished to satisfy himself of the fact, and was much pleased that the cause of his child's sufferings appeared at last to be detected, and a prospect afforded of their being terminated at a fit time by an operation. I was never, after, however, able to distinguish it again, either with the flexible catheter, or a metallic instrument. But, when he was recovering from the attack above-mentioned, he one day voided a piece of coagulable lymph, of the same form as the films which had used to come away, but of much more solidity, and containing calculous matter on both its surfaces, which was easily rubbed off. After this he felt much relieved. He once or twice brought away some small films resembling the former, but he had no return of the symptoms which before distressed him. After some time he went to Antigua, where he now is. I have heard of him twice since his residence there; and, in his letters, he has stated himself to remain perfectly free from his complaint.

In this instance it appears most probable, that the little cysts or films, which he had been used to void, were portions of coagulable lymph, thrown out and detached, from time to time, from some small part of the bladder, or of the pelvis of the kidney, in contact with which some calculous matter had been deposited. When violent increase of action, by inflammation, took place, the calculous matter was dislodged, and the cause of the disease removed. However, as it did not return, a salutary change must also have been produced on the part primarily affected.

But in the most favourable cases of lithotomy, no particular inflammation of the internal coat of the bladder appears to follow the operation. The change which takes place in it must, therefore, depend on some other cause; and seems chiefly owing to the quiescent state in which the bladder remains for many days after the operation, and by which it is enabled to recover a healthy condition. In this it will probably continue, if no fresh cause of irritation be applied to it. I am the more disposed to believe, I have not ascribed too much to this circumstance, from the benefits so often derived in other parts, which have been long in a state of morbid action, when their functions can be a while suspended, and from the facility that suspension affords to the successful prosecution of the treatment of their diseases.

In many diseases of the extremities, the necessity of this repose is obvious, and, fortunately, so is often the possibility of attaining it. But what shall we say to diseases of the stomach, of the urethra, and of other parts, to the functions of which it does not at first seem probable that any material suspension can be admitted?

Yet in several very obstinate cases of fistulæ in perineo, particularly in one which had arisen from a violent contusion, and was accompanied with great induration in the perineum and scrotum, from repeated inflammations and abscesses which had formed, and where from the consequent obliquity and irregularity of the canal of the urethra, added to its extreme irritability, little or no progress was made by the bougie; I was led to recur to the principle I have mentioned, and to consider whether some advantage might not be gained, if the treatment were *commenced*, by making such an opening into the urethra, behind the seat of the obstruction, as would allow the whole of the urine to pass through, without getting to the diseased portion of the canal, and insinuating itself into the sinuses that communicated with it. By thus keeping the parts without their accustomed stimulus, and allowing them to remain in a state of comparative rest for some days, I hoped so to diminish their irritability, swelling, and hardness, as to attain greater facility in carrying on the requisite treatment by the bougie and catheter. I was the more strongly inclined to expect success from this measure, from having observed the beneficial change which had almost immediately taken place in the state of the urethra, in two cases where I had found it necessary to puncture the bladder through the rectum. The result of such an opening into the urethra, as a preliminary step in the treatment, fully equalled my expectations. The parts having their chief source of irritation for a time withdrawn, in a few days became more yielding; the sinuses which were produced were consequently more easily traced through all their irregularities; way was more readily made for the passage of an instrument; and sufficient access to the bladder was soon obtained for the passage of a full-sized catheter. The old sinuses were then readily traced and laid open, so as to make them granulate from the bottom and heal.

It has not been unusual to make such an opening into the urethra, when, in consequence of its being torn, or ulcerated, either from external violence, or in cases of stricture, the urine has escaped into the cellular membrane; in which instance it becomes immediately necessary to prevent, or stop, the mortification, which arises from the diffusion of this pernicious fluid. But the propriety of it, in those cases to which I have before alluded, has not been, I think, sufficiently considered; at least, I do not know that it has been proposed by any writer on these diseases. But the arguments in its favour, and the success I have experienced from it, make it appear to me deserving the attention of surgeons.

It must, however, be observed, that the indurated and thickened state of the perineum, and the contraction of the urethra, render it often rather a difficult matter to find the canal; and therefore a free division of the integuments, in the first instance, will be prudent. And, indeed, by a free incision through the hardened integuments, considerable advantage may be gained. For, in some cases, the urethra itself is not primarily diseased to any great extent, but its canal is made irregular, and its internal surface crumpled, as it were, in consequence of the mischief around it, so that, in several instances, where I have removed the penis and bladder after death, although the smallest instrument could not be passed without great difficulty before, yet, when they were detached, a large catheter has readily gone on into the bladder.

As a remarkable example of this fact, I may mention a servant of the late Mr. Wathen, who had laboured under fistulæ in perineo for twenty years, during which time, he informed me, a bougie had been once only passed into the bladder, and that was by the late Mr. Hunter. On the last occasion in which I was sent for to visit him, he not only suffered from disease of the perineum and bladder, but was evidently consumptive, and fast approaching to dissolution. I made various attempts to introduce an instrument into the bladder, and succeeded once in passing a very small bougie. No particular relief followed; indeed, the parts seemed rather irritated than benefited by it. On his death, I fully expected to find the urethra almost closed up for some considerable extent; but when I had taken away the penis and bladder, and the urethra was thus disengaged from the hardened cellular membrane and skin, a sound readily passed on to the bladder; and, on laying open the canal, I found no regular stricture had been formed, but that it was a little bent aside at that part; and for near two inches, from the commencement of the bulb to the prostate gland, its surface had the appearance of being crumpled or puckered into folds; which, with the indurated state of all the surrounding parts, accounted both for the difficulty of passing a bougie, and also for his being able to get the urine away with more ease than could have been expected, under so much apparent obstruction.

I have, therefore, no doubt that such a state of the urethra, accompanying fistulæ in perineo, is more common than is generally supposed, especially where the disease has originated from external violence, and that it is often confounded with common stricture. In such cases a free division of the diseased integuments down to the urethra, in performing the operation I have recommended, must tend materially to relieve that portion of it, by setting it at some degree at liberty; and by this, connected with the opening into the canal behind the diseased part, which will prevent the urine from forcing itself into the sinuses, a material advantage will be early gained, and a great hindrance to the treatment removed. The constitution, also, will sooner feel relief, in consequence of that which is afforded to the diseased parts; those medicines, which may be required to restore the general health of the patient, may therefore be exhibited with less interruption; and the cure will thus be more speedy, and probably more complete.

HISTORY

OF A SINGULAR

NERVOUS OR PARALYTIC AFFECTION,

ATTENDED WITH

ANOMALOUS MORBID SENSATIONS.

COMMUNICATED BY

DR. MARCET, FOR. SEC. &c.

Read Dec. 18, 1810.

THE gentleman who is the subject of the following singular case is Dr. Vieusseux, an eminent physician, of Geneva, who studied Medicine in Edinburgh and London, about forty years ago, and again visited this country in the autumn of 1810. *Whilst in London, he was induced to draw up and communicate to the Society the particulars of his own case, which he has since authorized the Council, through the foreign secretary, to publish in this volume.*

A physician *, sixty-two years of age, of active habits of life, and addicted to no kind of intemperance, of a healthy though rather bilious constitution, and for many years past subject to slight rheumatic pains, which however had not interrupted his professional pursuits, was seized on the 29th of December, 1807, with a pain in the gum, just under the third double tooth, on the left side of the lower jaw. The pain continued severe during 24 hours, then the part swelled, and but little uneasiness remained; but he could not eat any food that was at all hard, even though he did not chew it with the diseased tooth. He continued to go out as usual, though the weather was very cold.

On the fourth of January, 1808, he felt, whilst at dinner, rather an acute pain in eating a piece of meat; this pain quickly subsided, but was followed by a general sensation of cold, which obliged him to rise from table to warm himself, though the room was heated by a stove. He soon returned, however, to finish his dinner. In the evening at six o'clock, whilst visiting a patient, he suddenly felt a slight pain in the swelled gum, and an extremely acute one in the internal angle of the left eye; this pain lasted a few seconds, then ceased, but

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* Dr. Vieusseux's stature is of middle size; his neck is rather short, and his frame strong, though not corpulent. He is of a fair complexion, and of a sanguine habit.

returned in a short time with increased violence, and attended with the following symptoms: a peculiar and inexpressible perturbation in all his sensations; a giddiness which made him see objects reversed, and occasioned feelings similar to those produced by a ship violently agitated, such as sickness and vomiting. These were followed by intestinal evacuations, and by a complete loss of his voice, which rendered his speech almost unintelligible, though without affecting his power of articulation. He also experienced a considerable difficulty in swallowing liquids, when in small quantities, and a sensation of weakness throughout the left side, with a numbness in the hand and the leg. He was able to walk, however, supported by two persons, but dragging his left leg; and the motion of the fingers, though benumbed, continued free. In this state he was with some difficulty conveyed home in a chair. After being put to bed, he found himself free from pain, and observed that he could move all his limbs, although he continued to experience the same giddiness. His intellectual faculties however remained quite unimpaired, so that he could accurately observe the whole succession of symptoms. On examining himself he discovered, that the whole of his right side was so insensible, that he could be scratched or pricked, without experiencing any pain; and that this insensibility abruptly terminated at a line dividing the whole body in a vertical direction.

The pulse being neither full nor hard, and not exceeding 90, and the countenance being rather pale, the patient was not bled, but three leeches were applied to each temple, a blister to the back of the neck, and one to each leg; and a julep with æther and tincture of amber were administered.

The night passed without accident; the next morning he took some emetic tartar; but the same difficulty that he had in swallowing, he seemed to experience in vomiting, and it was only by assuming a particular attitude, and turning himself on his left side, that he succeeded in vomiting, an operation which had the effect of considerably diminishing his giddiness.

In the course of the day, the diseased tooth was extracted, and about half a spoonful of black blood was discharged from the gum by that operation. The swelling did not immediately diminish, but it subsided in the course of a few days. The root of the tooth had lost its polish, apparently by the effect of the suppuration of the gum.

The third day a blister was applied to the head. On the same day he began to be effected with a violent hiccup, which lasted till the seventh day, and for which he desired to have leeches applied to the fundament, as he had seen this treatment succeed in removing that particular symptom, and because it appeared to him that the continual irritation of the diaphragm might occasion congestions of blood, although such a state might not have prevailed in the first instance. He lost about 18 ounces of blood by the leeches, contrary to the advice of his medical friends, who had prescribed, or rather consented, to a much smaller evacuation. The effect of these evacuations was completely to cure the hiccup, which returned no more, and yet the patient was not weakened by this treatment. A number of antispasmodics had been previously tried without success.

The disorder went on afterwards for about three weeks, in the form of a bilious fever, that is, nausea, want of appetite, and foul tongue, with an apththous state of its surface. The patient was put under the usual plan of gentle evacuating remedies. The appetite returned, and by slow degrees he regained his strength without any paralytic relapse, but without any diminution of the peculiar sensations which had taken place at the moment of the attack.

These symptoms, which constituted the singularity of the case, we shall describe such as they were at the beginning of April, which was about three months after the first attack.

Left side. The left half of the head was insensible either to pricking or scratching; this insensibility prevailed over the left half of the forehead, of the nose, of the upper and under lip, of the chin and over the left ear. The eye on this side was partly shut, and the corner of the mouth slightly drawn downwards; the tongue, when put out, was turned rather to the left than the right side, but to a very trifling extent. The hand and fingers had a sensation of numbness, as after having struck a violent blow on a hard body, particularly the thumb and the first and middle fingers. In the whole of this side there was a sensation of weakness; the leg dragged a little in walking; but it had not the feeling of numbness of the hand; and indeed except the peculiar affection of the face just described, the whole of the left side of the body preserved its usual degree of sensibility.

Right side. The right side of the head possessed the same sensibility as before the attack. It had experienced at first a very slight degree of insensibility, but in the course of three or four days had returned to its natural state. With respect to the other parts of the body, if a line of division were drawn in a vertical direction from the lower part of the neck or upper part of the sternum, descending forwards all the way between the lower extremities, and rising backwards up to the nape of the neck, every part of the body on the *right* side of that line was insensible either to scratching or pricking, and even to the pain that inflammation usually produces; for the vesication on the right leg, which lasted and suppurated much more than that on the other side, occasioned merely a sensation of heat, and no pain whatever; and even a boil or furuncle, which appeared after the blister, on the right leg, with a considerable swelling and redness, produced only a sense of heat and tension, though under other circumstances it would have proved very painful. A blistering plaister which had been applied to the pit of the stomach for the hiccup, gave pain only on the left side, and none whatever on the right. And in the same manner a gathering at the root of a nail of the right hand, (which arose from the patient having torn off the skin without being aware of it, and which occasioned the loss of the nail,) produced fever and strong pulsations in the affected part, but no sense of pain.

The sensations of heat and cold were in this (the right) side, totally different from what they naturally are. When the patient put his right arm out of bed, the air of the room felt extremely hot. One day when he was getting better, an attendant brought him an etherized julep, which he took with his right hand, and the bottle felt lukewarm; but on taking hold of it with the left hand, he found it cold, as it really was. A new-laid egg having been brought to him for his dinner, on taking it with the right hand, he did not find it hot; but with the left it actually burned him.

He then distinctly perceived that, to the right side, cold bodies appeared hot, and hot bodies appeared cold, or only lukewarm. This is to be understood of liquids and of polished bodies, as glass, stones or metals, or even wood with a polished surface. Thus on putting his right hand into cold water, it seemed lukewarm, and on putting it into boiling water it appeared so far from hot, that he would have kept it immersed without being sensible of its scalding him, had not a disagreeable sensation, different from that of burning, at length warned him to withdraw it.

But when he touched bodies that were not hard or polished, as the hand of another person, he could not judge of its degree of warmth, it appeared neither hot nor cold, and he was obliged to touch it with the left hand, in order to ascertain its temperature.

Nevertheless he had in no degree lost the sense of touch, and he could perfectly feel the pulse of a patient with his right hand, and judge of its frequency and of its strength; but in order to know the heat of the skin, he was obliged to have recourse to his left hand. This depraved sensation extended over all the right side; and consequently on putting him into a cold bed, it appeared hot to the right side, and cold to the left. In getting into a hot bath, it felt hot to the left side, and neither hot nor cold to the right; and in plunging into very cold water, which he did at a subsequent period, the water appeared almost warm to his right side, but very cold to the other.

He had often a sensation of cold water all over his face, especially when in the open air, which induced him to wipe himself as if he had been wet.

His sleep was good, and he generally rose in the morning with a clear head; but in about an hour it became somewhat confused; it was neither headach nor vertigo, but something approaching to the feeling experienced after looking steadfastly at the sun, or after drinking mineral waters which do not pass away, but affect the head. This state, however, generally went off after dinner, particularly after drinking wine, and though he was accustomed to sleep in the afternoon, he arose from this sleep with his head clear, and continued well all the rest of the day. He felt no uneasiness even in hot rooms at night: in a numerous assembly, indeed, it happened to him as to others, to feel his head somewhat affected; but this went off of itself, even whilst remaining in the hot crowded room. His voice was very faint, so as to render his speech often unintelligible. There was also some derangement in the functions of the œsophagus; solid or liquid food passed with ease, but that of an intermediate consistence, as pudding, thick soup, or soaked bread, descended with considerable difficulty; and frequently, particularly at night, the food returned into the mouth by a kind of rumination.

It would be tedious to relate all the remedies he took during thisi llness; they were chiefly of the antispasmodic and tonic kind, such as bark, valerian, assa-fœtida, camphor, volatile tincture of guaiacum, compound spirit of lavender, various chalybeates, stimulating frictions, &c. &c. These remedies, which he used in considerable doses, and during a length of time, did not afford him any critical relief; but yet whilst taking them, his health gradually improved.

He used electricity during three months in the form of sparks. This remedy having been resorted to on rather vague indications, and not appearing to afford any distinct relief, he interrupted it for a fortnight; but he then felt weaker, and having returned to it, he found himself benefited by it. The sensations produced by the sparks were much less vivid on the right side than on the left.

The winter of 1808 was extremely severe; and the snow remained on the ground till the end of

March, which prevented his going out on foot, and rendered even riding in a carriage difficult. It was not till he could go out in the air every day, that his general health sensibly improved.

In the middle of June 1808, he went to the baths of Aix, in Savoy, and took hydro-sulphurated *douches* at the temperature of 106° or 108° of Fahrenheit. He returned thither in September, and during the interval, that is to say, in July and August, he bathed in the *Arve*, a river formed by the melting of the snow on the summits of the Alps, the temperature of which is not above from 52° to 56°, even when the atmosphere is between 80° and 90°. Both times, previous to going to Aix, he took the precaution of applying leeches to the anus, in order to prevent the head from being affected by the heat and vapour of the water.

The hot *douches* and the cold bathing thus used alternately, appeared to have little effect on the immediate symptoms of the disease; but the patient's strength and general health improved considerably, so much so that he had every appearance of health, and could act and walk as usual, but was unable to run.

From this time his health continued constantly to improve, and though the peculiar symptoms still remain, yet the digestive and muscular powers being restored, the patient bears these with much less inconvenience, so much so indeed, that he scarcely perceives them when he is not directing his attention to the subject, and particularly during the latter part of the day.

He has continued to bathe in the river during all the hot and temperate season, and has discontinued it only in the winter; and even then, when the weather has been relaxing, he has used the cold bath at home, and has been always careful to wash his head with cold water. He has occasionally taken aloetic pills, and has found them useful.

In 1809, being still subject to the peculiar sensations in the head formerly described, especially about an hour after rising, it occurred to him that, as this symptom was nervous, if he could, previous to its coming on, excite by artificial means an analogous state, he might probably avoid the recurrence of the morning paroxysm. For this purpose he tried smoking, which he had never been accustomed to. He smoked about half a pipe, the effect of which was to produce the peculiar giddiness which usually takes place on smoking for the first time; at the same time a grateful warmth pervaded all his limbs on both sides. This state gradually subsided, and he actually got rid of his giddiness that day sooner than usual. He therefore continued to smoke almost every morning, and has persevered in the practice to this day with apparent benefit. The affection of the head has been diminished, and the voice manifestly improved, from the very first trials.

It is now three years since this illness began, and the following is an exact description of the state in which the patient finds himself at present.

The insensibility of the *left side* of the face has gradually diminished; it has ceased in the under lip, in the chin, in half of the cheek, and in the ear; it remains in half of the nose and of the forehead, with a slight sense of tension and numbness; the affection of the inner angle of the eye, and of the corner of the mouth, have entirely disappeared. There is still a slight sense of numbness in the three first fingers of the left hand, but scarcely worth noticing. When the patient is not so well as usual, it is in the left, and not in the right side, that he feels weakness.

The right side is as it was at first; the insensibility and depraved sensation continue as before. There is constantly a sense of heat throughout that side, often as if by puffs, or as if hot cloths were suddenly applied to the parts. At first the patient thought that this portended some improvement, but he has found no effects to result from it either good or bad. Cold bodies still appear to him lukewarm; it is not merely the absence of cold, but a positive sensation of warmth; and hot bodies feel almost cold, at least neither hot nor cold. This side appears to have more vital action than the left side; it perspires more easily; the ear on the right side secretes double or triple the quantity of wax that the other does; and in general there is in that side a greater sense of energy and vigour.

This side does not appear to be susceptible of pain. It has been already stated that the inflammation and suppuration occasioned by the blisters, by the boil, and by the whitlow, produced only a sensation of heat and tension, without any pain. It is the same with every kind of injury, whether by a blow, or by solution of continuity. A scratch on the little toe, followed by inflammation, swelling and suppuration, produced only a sense of heat and tension. The prick of a thorn in the bone of the leg, which bled a good deal, produced only the sensation of an obtuse body.

The patient continues to be occasionally afflicted with rheumatism, but the pain is felt only in the left side. In the right it occasions only a sensation of local weakness, attended with an undefinable feeling of heart and itching, but without pain. A lumbago, to which he is frequently subject all over the region of the sacrum, is painful only on the left side, though he is very sensible that it exists also on the right side. When the cramp seizes him in the calf of the right leg, the sensation produced is widely different from the acute pain which he experiences when the left leg is affected by the same cause. He has no longer a sensation of cold water over his face. He walks with tolerable firmness, but would not be able to run. A slight tendency which he had to œdema, in both legs, but more particularly in the right, has entirely ceased, though the patient has lately taken a long journey in a post-chaise. The voice, though much improved, is still hoarse. The deglutition of bodies of soft consistence is not perfect. The peculiar sensations in the head return almost every morning, and generally continue throughout the day; but in a much less degree than formerly, and they go off after eating, particularly after drinking wine. Sometimes it has appeared to him that the right side of the head was most affected: but this so indistinctly, that he cannot draw any positive inference from that remark. The cloudy atmosphere and damp weather of England, and perhaps the smoke of coal fires, appear to be unfavourable to the clearness of his head, though they have by no means impaired his powers of attention in reading, writing, and the pursuit of his usual studies. Seasons more decidedly hot or cold are those which agree with him best.

On reflecting on all the circumstances of the case, the following is the opinion which the patient has formed of his situation.

The principle appears to have been catarrhal, and to have originated in the diseased tooth. The disease in many respects may be compared to a paralytic attack, but it differs from it, 1st, because the motion of the affected parts has always been free, notwithstanding their diminution of power, and depraved sensations; 2dly, because there has been no paralytic affection of the tongue; 3dly, because there has been no affection whatever either of the intellect or of the memory, and that the patient has never articulated one word for another; 4thly, because there has been no inclination to depression of spirits or effusion of sensibility, such as commonly occur in this disease; 5thly, because the complaint still exists, and that so slight a paralytic attack either would have been completely cured, by such a general amendment of health, or there would have been a relapse during the three years that the illness has lasted.

From all these considerations he is inclined to believe, that his disorder is only a peculiar nervous affection; and that the brain was not originally affected as is the case in paralytic attacks. He well recollects having seen a patient labouring under hemiplegia, who retained his power of sensation in the palsied side, and not in the other; but it was a complete case of hemiplegia, in which the brain was visibly affected, and which terminated in death.

In this case there seems to have existed, as it were, two distinct kinds of paralytic affections: one on the left side, the other on the right.

That of the left side bears the most resemblance to hemiplegia, and appears to have attacked the muscles. The face, on that side, had, from the beginning, a sensation of stiffness and tension which it still preserves, though to a smaller extent. Although the motion of the fingers is free, there is, however, either in bending or extending them, a sense of numbness, which is still perceptible in the three first fingers. In short, the patient has constantly a feeling of comparative weakness in the left side, and if he is threatened with hemiplegia, he thinks it is rather in that side than in the other.

The affection of the right side is merely cutaneous, and does not seem to extend to the muscles; for there is no kind of numbness or stiffness in their functions. These differences, however, are not strictly confined to each side; for the muscles on the right side participate in some degree in the insensibility which pervades the cutis; as appears from the absence of pain when they are affected with spasm or rheumatic inflammation. This condition of the muscles appears to be limited to those that are superficial; it does not extend, for instance, to the fibres of the intestines or bladder. On the left side, too, the paralytic affection of the forehead and neighbourhood of the eye, is not merely muscular; since the eye and forehead on that side are insensible to the impression of ice. There is, no doubt, some muscular fibre palsied in the œsophagus, and in the larynx, as deglutition is not perfectly free, and the voice is still hoarse. The patient does not attempt to explain the depraved sensations of the right side; he is satisfied with relating the facts, and leaves it to more skilful anatomists to explain which are the nerves affected on either side.

He believes that the peculiar sensations of the head arise from a derangement of equilibrium in the distribution of the nervous influence; since every circumstance which contributes to the improvement of his general health, tends to restore the natural state.

Thus he feels well at night when in bed, and in the morning after sleeping. He is worse after being up some time. He is better after his meals, particularly after having drank a moderate quantity of good wine. He feels well in a carriage; it has the effect of carrying off the uneasiness of the head; and owing to this circumstance he has suffered little from the fatigue of his journey. These uneasy sensations in the head which are produced by a hot or crowded room, subſide after having remained in it some time; and this atmosphere which incommodes others, ultimately does him rather good than harm. This circumstance seems to shew that there is no organic affection of the brain. But the patient is well aware, that although this state of the head may not arise from any local cause in the brain, yet the frequent recurrence of this symptom, might in the end produce a local congestion, which he ought to use every precaution to prevent.

These details may, perhaps, be deemed to have extended to too great a length; but the case appeared to the narrator sufficiently singular to induce him to comply with the request of his friend Dr. Marcet, that it might be presented to this learned Society; and he will be happy to satisfy the inquiries of any of the members present, who should wish for further information with regard to the facts he has related.

Postscript to the 3d Edition; by Dr. Marcet, May, 1816.

Dr. Vieusseux continued nearly in the state above described till April 1813, when he was suddenly seized with great debility, especially in his left side (all the motions of which however remained free), with giddiness, and palsy of the mouth and tongue. He soon recovered from the paralytic affection; but a great debility remained, and a sense of lassitude in his head, which was always greatly relieved by taking food. About this period, he had a severe ophthalmia in his left eye, which however occasioned no pain; for the insensibility of that side, and all the peculiarities described in the case, continued to prevail to the last day of his life. In September 1814, he was suddenly seized with severe symptoms of fever, attended with extreme weakness, and with a sensation of heat in the brain, but without the least diminution of his intellectual powers, and without any change in the singular circumstances of his original disorder. On the 20th of the following month, he died in a state of complete exhaustion, after two days of a lethargic sleep. It is much to be regretted that his head was not opened. *(Extracted from the Bibliothèque Britannique,* 1815.*)*

ACCOUNT

OF

A SINGULAR AND FATAL DISEASE,

OCCURRING

IN SEVERAL PERSONS IN THE SAME HAMLET.

BY MR. HENRY GERVIS,

SURGEON AT ASHBURTON.

COMMUNICATED

BY DR. CURRY.

Read Jan. 15, 1811.

Monday, March 23, 1807.

I WAS requested this morning early to visit the son of a farmer Wilcox, aged nine years, residing at a village in Dartmoor, called Blackaton; the situation of which is high, and on a declivity, about eight miles from Ashburton. About four families live in the place, and their general health, for many years past, has been very good. The family, to which the patient belonged, consisted of fourteen persons, including servants, labourers, and children, all of whom dined together on the preceding day, and were *perfectly* well. At four in the afternoon of that day, this little boy first complained of pain in his head, attended with slight rigors. He was immediately put to bed, and had some tea given to him. During the night the pain of his head increased, and some slight convulsive affections of the limbs were noticed. He had little thirst, and the heat of his skin was not greater than usual. Early in the morning a slight sickness supervened; and soon after he became totally insensible, and much inclined to sleep.

I saw him about ten o'clock in the morning, and found the pupils of his eyes fully dilated, with a weak pulse, not exceeding 80, a preternatural heat on the skin, his breathing free, tongue and teeth moist. On the strictest inquiry, I found that his health, previous to this attack, had been very good, and that his diet had been the same as that of the other branches of the family. As there evidently appeared a strong nervous affection, I suspected that water might have been the cause. His countenance was not flushed, but rather pale. I immediately gave him fifteen grains of ipecacuanha, which I had taken with me, and it fortunately excited vomiting in about half an hour; after which I gave him a laxative, which also succeeded, and then a mixture, with the mist. camph. et liq. amm. vol. A large blister was applied between the shoulders, and his feet and legs bathed with warm water. Late in the evening he was no better; but, in the course of the night, he expressed some fear on seeing a candle in the room; and on being asked, if he did not also see his father, who was then near him, he replied, No.

On the Tuesday morning, about eight o'clock, a messenger came for me to see his elder sister, aged 16, whom I had seen the day before in perfect health, having sat up with her brother during the night. When I came to the house, on observing two young persons in great distress, it struck me that the boy was dead. On inquiry, however, I found that he was better, but that the girl was expiring. On entering her apartment, I remarked that the pupils of her eyes were fully dilated, and the tunica albuginea completely suffused with blood. Her pulse was not to be distinguished; and in about five minutes she died. On her neck and breasts I discovered several very large and irregular purple spots. Her teeth were white and clean, and tongue moist. The mother informed me, that she had been attacked the preceding evening* with cold shiverings, which were soon after succeeded by great heat in the skin, thirst and restlessness, acute pain in her head, and slight soreness in the throat. About five o'clock in the morning, sickness and vomiting came on, and soon after a total privation of sight and sense. They remarked nothing particular, either as to appearance or smell, in the discharges from her stomach or bowels; nor was there during my stay, any offensive fœtor whatever.

On quitting her room, I went to see her brother, and found him considerably better. He was perfectly sensible, his pulse regular, but complaining of a violent pain in the right foot; on examining which, I observed the ball of the toe very much inflamed, as also the ancle and knee, accompanied with much pain on slight pressure. His leg was very much contracted. I directed the same medicines to be continued, and a fomentation for the leg, which totally removed the complaint in the course of a week, and he has since continued well.

The daughter was buried on the Thursday evening (the 20th) and attended by the father, who, as well as all those accompanying the corpse, never discovered the least disagreeable effluvia. On his return home, being about three miles from the church, he felt himself quite well, and very hungry; ate a meat supper, to which he was not generally accustomed, and went to bed about ten o'clock, free from complaint. Very soon after, he was attacked with a violent pain in one foot, which soon extended to the other, and from thence to the small of his back, below the region of the kidney, where it remained so acute, that he was obliged to be supported nearly in a sitting posture, not being able to lie down. I was sent for between two and three in the morning, and got there soon after four. His brother was supporting him behind, and his wife, in bed, assisting him also. His pulse was 100, and weak; his countenance remarkably pale;

tongue moist; the general surface of his body rather cold than otherwise: there was neither oppression at his breast nor difficulty of breathing, but a disposition to vomit, with some slight pain of the head. His legs were then free from pain, and unattended with any sort of external inflammation or soreness. I gave him a small dose of ipecacuanha, which very easily discharged the undigested part of his food, consisting of several portions of fat, &c. He vomited twice only, and felt soon after more at his ease. His feet and legs were bathed with warm water, as also his back; and in two hours he was enabled to lie down. I then gave him a laxative, which produced its proper effect, and directed for him some bolusses, with the sal. amm. vol. & confect. aromat. At four in the afternoon, the pain left his back, and attacked his stomach, to which a blister was applied, and at eight he died, being sensible to the last moment; and neither then, nor subsequently, did there appear any petechiæ, nor did there arise any putrid effluvia.

In this case the nervous system did not shew any particular affection, as his vision was perfect, and his intellect good; and he was without the least inclination to sleep. I made every inquiry, both with regard to their diet, and culinary utensils; and whether any of the water which passes near some tin-mines had been used, but could discover nothing that could lead even to a conjecture as to the cause of these attacks.

The remaining part of the family continued well until the 29th of April, when I was desired to see another son, who arose in perfect health at six in the morning, attended the workmen in marking some cattle, and began to complain of a slight soreness of his throat and pain in his head, at eight o'clock, which induced him to return; had some tea given to him; and lay down on the bed, with his clothes on. At twelve his mother, not finding him better, put him into bed, and gave him some more tea. From this time till four, no sensible alteration appeared. He had slight shiverings, but the heat of his skin was not greater than common. At four o'clock he grew sick, and vomited, and immediately after became insensible to every thing. At a quarter past eight o'clock I saw him. His pulse could not be distinguished; not even the pulsation of his heart. The pupils of his eyes very much dilated, but the tunica albuginea not inflamed: teeth and tongue moist, respiration free, and no disagreeable effluvia whatever. I endeavoured in vain to make him swallow a tea-spoonful of wine, and he expired in about ten minutes.

On Saturday, the 9th of May, I was requested to see a brother's apprentice, about eleven years of age, who resides in the same village, and who was attacked about eight o'clock the preceding evening, with slight rigors, sore throat, pain of the head (not violent) and stiffness in his limbs. He was immediately put to bed, and appeared very much inclined to sleep. He had some slight flushes in his face, and much heat in his skin, but did not complain of thirst. The pediluvium was used, and warm diluents frequently given to him. At four in the morning he became sick, and retched much. Having a small dose of ipecacuanha in the house, they gave it to him; and soon after I was sent for, but he died before I arrived. By the information I obtained from the widow Wilcox, who attended him from the first moment of his attack, I found that many large irregular purple spots had appeared in his neck and breast, about an hour before he expired; and that not only his alvine discharges, but his breath, had a very offensive smell. From the moment the vomiting came on, he became totally insensible; the eyes full and open, though not red; his extremities were cold; the fingers, and the lower parts of each eye, black; nose cold, and face very red. This boy had never seen either of the other diseased persons, having refused going near them.

I directed the houses to be thoroughly whitewashed, all the bedding to be well aired, the floors of the rooms to be well washed with vinegar, and the apartments to be properly fumigated with nitric acid gas. In no other family or village, either in the parish of Widdecombe, or elsewhere in this neighbourhood, has any thing of the kind occurred. The last who died, had the strongest marks of putrescence about him, and a good deal of this also appeared on the daughter, who was the second person attacked. The two first died within twenty-four hours from the attack, and the two last within thirteen hours. The unhappy termination of the complaint indicates strong contagion, the origin of which I am totally at a loss to conceive. The vomiting, in neither case, preceded the affection of the head, but always the privation of sense. From the patient's dying in the first stage of disease, no time was allowed for the operation of any medicine. In the house, where the attack first commenced, there are now eleven in the family, and all well; in the other about five or six, as yet, free from complaint.

HENRY GERVIS.

May 13. 1810.

CASE

OF

DYSPHAGIA,

PRODUCED BY ANEURISM OF THE AORTA

By T. J. ARMIGER, Esq.

SURGEON EXTRAORDINARY TO HIS ROYAL HIGHNESS THE DUKE OF KENT,
AND ONE OF THE SURGEONS TO THE EASTERN DISPENSARY.

Read May 8, 1810.

JOHN M'LAURIN, æt. 43, a native of Edinburgh, was admitted a patient at the Eastern Dispensary in March, 1810, under the care of Dr. Robinson, the physician to that charity. On the 27th of that month, in the absence of my friend and colleague, Mr. Luxmoore, the senior surgeon to the institution, I was requested by Dr. Robinson to see him.

He complained, that whatever he swallowed seemed to stop in his breast; that he felt great uneasiness just below the margin of the ribs on the left side, and that he seldom or never obtained relief, till, by frequent efforts, he succeeded in expelling the solid matter which would not pass downwards. His sustenance during March, and the preceding month, had consisted of tea, porter, and thin soup; and as the softened barley, from the soup, was generally rejected, there could be no doubt of the existence of stricture in the œsophagus. I examined the spot to which he referred his uneasiness, and pressed on the epigastric region generally, but discovered neither internal enlargement nor hardness. He had walked from his residence to the Dispensary, a distance beyond his strength, which occasioned his heart to beat more violently than usual. He had been subject to palpitations of the heart for some months previously, and very slight causes much increased their force and frequency. The palpitation, when I saw him, was such as even by sight to convince me that it did not proceed from any nervous affection.

On applying one hand to his left side, and the other to the sternum, I readily distinguished the agitated action of the heart, from a pulsation, attended with the sensation which is occasioned by blood passing into an aneurismal tumor.

I conjectured that some part of the descending aorta was the seat of aneurism, and that the dysphagia was occasioned by the pressure of the tumor on the œsophagus: the other particulars seemed to confirm this opinion.

He had exercised his avocation, which was that of a carpenter, chiefly on ship-board, in various parts, and till June, 1809, enjoyed almost uninterrupted good health, except suffering from a slight attack of dysentery, during a voyage from Jamaica.

In the latter end of that month, after having laboured almost incessantly for many hours at the pump, in consequence of the ship having sprung a leak, he first noticed a strong palpitation of his heart, which did not subside, as is usual, after exercise, but continued, and progressively increased in violence, to the present time.

He was now much emaciated, and his strength was much impaired; he stooped considerably; and in that posture, while leaning on his stick, or other firm support, was easier than when erect; more so when lying in bed, but most of all while resting on his knees and elbows. He lay with difficulty and pain even for a few minutes on his back. When on his left side, his respiration was hurried; but at other times, or in other postures, unless from exertion, it was scarcely affected. When the pulsation was most violent, it might readily be felt between his shoulders: the pain was at times piercing, shifting from his breast to his back, and *vice versa.*

When in the back, it was principally seated immediately below the inferior angle of the left scapula. About the beginning of December, 1809, he first swallowed with uneasiness: this increased till the end of January, at which time it seemed to lessen, and continued to do so till the beginning of March, when it suddenly became worse than it had ever been.

He was now so weak as to totter when he rose from his seat. His pulse was small in both wrists, but smallest and weakest in the left, and varying in frequency from 90 to 100; *in the right wrist from* 100 *to* 110 *in the minute.* He complained (to use his own expressions) of a constant "humming "sound" in the right ear; and in the left, of a noise similar to that which arises from the "striking of the edges of two knives together."

He was deaf, but most so in his left ear, both being free from cerumen. The ends of his fingers were occasionally numb; his feet were always cold; he felt great craving for food, but abstained from it almost entirely. On the morning of the 2d of April, he brought up nearly a pint of blood. Early in the afternoon his pulse intermitted considerably, varying from five to seven, and nine pulsations in five seconds. The pulsation of the aneurism was much reduced in strength; on the back it was scarcely perceptible. In the evening he lost, at once, at least a quart of blood, from which he fainted, and expired.

Having obtained permission to examine the body, I availed myself of the opportunity; and, on the 5th of April, in the presence of Dr. Robinson and Mr. Luxmoore, took an account of the morbid appearances, which were as follows.

Abdomen. In this cavity, there were four ounces of fluid, deeply tinged with the red particles of the blood. The stomach, duodenum, jejunum, and transverse colon, were considerably distended with flatus; the other parts of the intestinal canal were unnaturally contracted. The pyloric extremity of the stomach, the beginning of the duodenum, part of the jejunum and of the ilium, with the cœcum, were of a reddish purple colour, occasioned by an effusion of fluid between the peritoneal and muscular coats of those organs, which extended, in some places, between the layers of the mesentery and mesocolon.

Thorax. In both the cavities of the chest there was a fluid effused similar to that in the abdomen, in quantity amounting to about seven ounces in each cavity. The surface of the lungs was discoloured like that of the intestines, and from the same cause.

Pericardium. In the cavity of this membrane there were four ounces of fluid, of a darker colour than that either in the abdomen or thorax.

The heart, pulmonary artery, and the aorta, nearly as far as the seat of the aneurism, exhibited the natural appearances.

On raising the lungs, which were healthy, the aneurismal tumor, bounded by the layers of the posterior mediastinum, was readily distinguished. It was in the descending aorta, and was situated on the 8th, 9th, 10th, and 11th dorsal vertebræ; but they had not in the least degree suffered from its pressure. It seemed to be capable of containing about a pint of blood.

The layers of the mediastinum, the side of the œsophagus against which it pressed, and the cellular membrane connecting the parts in the cavity of the mediastinum, formed part of the parietes of the tumor. Within it, and adhering to its inner surface, and to each other, were several concentric strata of coagulated blood. Towards the upper and right side, the coats of the aorta were much thinner than in any other part, excepting immediately contiguous to the spot at which it finally burst into the œsophagus, at about two inches distant from the passage of that tube through the diaphragm.

The tumor seems to have been primarily formed by dilatation of the aorta, the larger part of it being on that side of the aorta, which is contiguous to the œsophagus. It was probably enlarging principally on its right side, during the time that the remission of the dysphagic symptoms occurred. A little beyond the root of the left subclavian artery, there was also a small aneurismal dilatation.

DISSECTION

OF A

LIMB ON WHICH THE OPERATION FOR POPLITEAL ANEURISM HAD BEEN PERFORMED.

BY ASTLEY COOPER, ESQ. F.R.S.

SURGEON TO GUY'S HOSPITAL.

Read June 18, 1811.

HAVING lately had an opportunity of dissecting the limb of a man who had a popliteal aneurism for which the operation of tying the femoral artery was performed seven years ago, and having injected and dissected the limb, I thought that a short account of the appearances, might not be deemed unworthy the Society's attention.

Independent of the gratification of curiosity in observing the mode by which the tributary streams supply the want of the chief channel of the blood, a knowledge of the exact course of the enlarged arteries will be useful in the after treatment of patients who have undergone the operation for aneurism, as it will teach the position least liable to compress the anastomosing vessels.

When this limb is examined, it will be seen that the arteries, which form the new circulation, are not only enlarged, but that they have also become *tortuous.* This change in figure is at first the effect of an increased momentum of the blood in the anastomosing vessels which elongates them, and therefore prevents their lying in the same space as before, a circumstance that may be at all times seen on injecting arteries, that if the injection is much forced, the vessel becomes serpentine. But in the living artery this tortuous course is established by a new growth; for at the time that the vessel elongates and increases in diameter, its coats also become considerably thicker than natural; and thus it is kindly provided, that as the vessel enlarges, and the original matter of which it was formed is expanded over a larger surface, instead of the vessel becoming thinner, the increased determination of blood upon the artery occasions the deposit of additional matter in its coats, and its strength, as well as its length and diameter, are increased.

In enlarged veins, as well as arteries, this tortuous course may be observed. This limb will shew it with respect to the arteries, and with regard to veins it will be well seen in a plate published by Dr. Baillie, in the work for the improvement of medical and surgical knowledge, in which a view is given of the vena azygos enlarged and tortuous from an obliteration of the vena cava inferior, and it may be at all times seen in varicose veins of the lower extremities.

This tortuous course of vessels will be also observed in the arteries of old persons, in whom the coats of the vessels are ossified; for in these cases, as the circulation is less assisted by the arteries of the part, the heart is called upon to make extraordinary efforts, by which the blood is sent with such momentum upon the aorta, as to increase its length and diameter, and render its course serpentine. It is in the aorta before it forms its curvature, in the abdominal aorta, and in the iliac arteries that this change is most conspicuous.

Any great increase in diameter of the anastomosing vessels is but slowly produced, for I have injected a limb several weeks after the operation for popliteal aneurism, without being able to force the injection through communicating vessels into the parts below. To enlarge the vessels much, it is necessary that the limb should have been employed in active exertion.

On account of the arteries not very readily enlarging, the limbs of those, who have undergone the operation for aneurism, are for a considerable time weaker than natural. They feel the influence of cold more, are more disposed to ulcerate from slight causes, and when sores are produced, have diminished powers of restoration. On account of the languor of circulation and the diminished power of resisting the influence of low degrees of heat, it is right, after the operation for aneurism, to clothe that limb much warmer than the other; for which purpose, a piece of flannel or a fleecy stocking should be applied to prevent the sedative influence of cold.

A man who had undergone the operation for popliteal aneurism, complained in the evening of his leg being painful, and a dresser going through the ward, applied a lotion of the acetate of lead, and when the rags were removed on the following morning, the limb was found mortified.

Mr. Campbell, a patient of Mr. Curtis, Surgeon in Whitechapel, underwent the operation for popliteal aneurism at a time when the weather was extremely cold. In three nights after the operation, he said his foot was benumbed, and when it was examined, it was found to be of a blue colour and quite cold. Frictions were immediately had recourse to; first with the hand only, and, after a time, with warm flannels, and the circulation was restored, although with considerable difficulty.

When a ligature has been applied, it is some time before the artery below becomes obliterated. Mr. Foster, Surgeon of Guy's Hospital, has a drawing in his possession of a case of popliteal aneurism, for which the femoral artery was tied in August; the man died in January following, and when the limb was injected, the femoral artery, below where the ligature had been applied, was found to have received a part of the injection by communicating vessels.

It is for this reason that the pulsation in some aneurisms where there are free communicating vessels, will remain for a considerable time after the operation. However, in twelve or fourteen months, when the femoral artery has been tied, it becomes obliterated, above the ligature to the arteria profunda, and below it, to the origin of the anterior tibial artery; and sometimes the remnant of the vessel is not only converted into a cord, but is ossified.

It is scarcely necessary to observe how improper it is to apply bandages upon limbs in which the principal artery has been tied; but I mention it because I have seen a roller used to confine dressings; on the same account it is required that attention should be paid to the position of the limb, to prevent any pressure being made by pillows, which may obstruct the course of the blood in its new channels.

Dissection of the Limb.

The femoral artery, which is necessarily obliterated by the ligature, was here converted into a cord from the origin of the arteria profunda down to the ham. The whole of the popliteal artery was also changed into a similar substance; and thus the natural channel of the blood from the groin to the lower part of the knee was entirely destroyed. The muscles, therefore, which usually receive blood-vessels from the femoral artery, as the sartorius, the rectus, and the vasti, had no branches but from the arteria profunda and circumflex arteries; and the articular arteries from the popliteal, although they were still capable of receiving blood, derived it, not from the popliteal artery, but from the communicating vessels of the profunda.

The arteria profunda formed the new channel for the blood. Considerably enlarged in its diameter, although still not equal in size to the femoral artery at the groin, it took its usual course to the back of the thigh on the inner side of the thigh-bone, and sent branches of a larger size than usual to the flexor muscles of the leg, and just midway on the back of the thigh it began to send off those arteries which became the support of the new circulation.

The first artery sent off passed down close to the back of the thigh-bone, and entered the two superior articular branches of the popliteal artery, which vessels supply the upper part of the knee joint.

The second new large vessel arising from the profunda at the same part with the former, passed down by the inner side of the biceps muscle to an artery of the popliteal, which was distributed to the gastrocnemius muscle, whilst a third artery dividing into several branches, passed down with the sciatic nerve behind the knee joint, and some of its branches united themselves with the inferior articular arteries of the popliteal, with some recurrent branches of those arteries, with arteries passing to the gastrocnemii, and lastly, with the origin of the anterior and posterior tibial arteries: and these new large communicating branches were readily distinguished from others by their tortuous course.

It appears then, that it is those branches of the profunda which accompany the sciatic nerve, that are the principal supporters of the new circulation. They were five in number, besides the two deep-seated arteries which do not accompany the nerve.

The external circumflex artery was considerably larger than usual for the supply of branches to the muscles on the fore part of the thigh, but it had no branches for the new circulation.

The obturator artery did not appear larger than usual, and although much pains were taken to trace any enlarged communicating branches between the ischiatic arteries and profunda, yet no vessels capable of receiving coarse injection could be found.

Anastomosis appears to be so free in all the arteries of the limbs and in the vessels of the head and neck, that there is no difficulty, with the precautions that I have mentioned, in the blood finding its course in new channels when the old are interrupted. If there is any exception to this statement, it is with regard to the subclavian artery. But experience is not yet sufficient to lead to a decisive judgment upon this point.

Mr. Ramsden has published an account of an operation on the subclavian artery, and the man does not appear to have died from want of anastomosis. Sir William Blizard has also lately tied this artery, and, as I understand, accomplished the operation with great ease; but the man was advanced in years, and much reduced in strength, and he died on the fourth day after it had been performed.

In other animals the blood may be diverted from its proper channels in all the external arteries of the body. The carotids, the femoral, and brachial arteries may be tied, and yet the life of the animal be preserved.

The preparations which I have now the honour of shewing to the Society were made under the following circumstances.

I have been long in the habit of tying the carotid arteries in the dog in my Surgical Lectures, for the purpose of shewing the falsehood of the prevailing idea that a ligature upon these arteries produces sleep or coma in the animal. In a healthy dog who had been the subject of this experiment, I made ligatures upon both the femoral arteries; and when these ligatures had separated, and the wounds had perfectly healed, I tied one brachial artery, and that wound having closed, the other brachial was cut down upon, and, as I supposed, divided and tied. The animal survived these different experiments, and lived above a year afterwards. Immediately after death it was injected, and the injection had passed so successfully in the neck, and in the thighs, as to make beautiful preparations of the anastomosing vessels. But the injection failed in one of the fore extremities, so as to leave a doubt whether the brachial artery had been divided, or the radial or ulnar under a high division of the brachial artery. This, however, is certain, that the animal lived for more than twelve months with the two carotids, the two femorals, and one brachial artery obliterated.

These experiments were made not merely with a view to ascertain the extent of the anastomosing principle, but also for the purpose of learning if any change would be produced in the habits of the animal, in consequence of the blood circulating through new and numerous channels; for it has been observed by Mr. Carlisle that slow moving animals have such a circulation; but with regard to this dog, he remained equally lively and active as before.

Lastly, I was anxious to ascertain when even the aorta was tied, if the blood would still find its course by anastomosis.

It is now more than two years ago that I opened the abdomen, by an incision of about three inches in length close to its junction with the loins, and turning aside the peritoneum with my finger, I felt the aorta pulsating, and passing a blunt hook under it, easily put a ligature around it.

During the last winter, assisted by my friends Mr. White and Mr. Dean, two of our most promising and intelligent pupils, I repeated the experiments, and have the honour of shewing to the Society the aorta tied and divided, the animal having survived the experiment, and maintained his usual health; the ligatures coming away as other ligatures upon arteries, and a successful injection having been made of the body, the anastomosing vessels are beautifully seen. These were sufficiently large and numerous to allow of a free injection of the femoral vessels.

Some degree of weakness is produced in the hinder extremities by a ligature made upon the aorta; but it is not sufficient to prevent the animal from using them with great freedom, and would scarcely be observed by one who knew nothing of the experiment.

Previous to the animal being killed, the femoral artery and vein were laid bare; the blood in the artery was florid as usual, and passed with a motion that was pulsatory, although weaker than natural.

A CASE

OF

HYDATID IN THE BRAIN.

By Mr. MICHAEL MORRAH,

SURGEON AT WORTHING.

COMMUNICATED BY

DR. YELLOLY.

Read Feb. 12, 1811.

ELIZABETH LINDUP, 19 years of age, of a most robust make, and general good health, began to complain of pain, and a swimming of her head, about three years back; which symptoms were always increased upon motion, and particularly by stooping. They continued with occasional exacerbations, accompanied by irritation of the stomach, and a suffusion of the eyes (such as is produced by crying), till the 22d of April last; when, during her occupation of cooking a dinner, she was seized, without any previous warning, with a fit;

during which she had no convulsions, but was represented as lying motionless, her inspirations being very long and deep, and gradually becoming less so till her recovery.

This happened immediately after the completion of the menstrual flux, and lasted some minutes. I saw her before the fit was quite over, and was particularly struck with the complaint she made of an acute fixed pain of *the head*, and with the ferrety appearance of the eyes. One month from this time she had another fit, which seized her so unexpectedly, that she dropped with a pan of milk in her hand; and from this time till the 20th of August, she had a paroxysm every third week, which might be said to consist of two fits; one in the evening, from which she very imperfectly recovered, till after a second, which came on the next morning; after which she continued free from any fit for three weeks.

On the 20th of August, she had three fits in one day, accompanied by considerable derangement of the stomach, and by screaming, and other indications of great suffering, amounting almost to delirium. A succession of these distressing attacks increasing in severity, and with stupor intervening, continued till the middle of September, when she had nearly lost her hearing. Shortly afterwards she lost the sight of her *right* eye, and in fourteen days more, that of her left. Her smell was completely gone, and the olfactory nerves were insensible to the stimulus of hartshorn; her speech and power of deglutition were very much impaired, and her left side (of which she had previously complained, as being affected with rigors) became paralytic. On Friday, the 7th December, she fell into an apoplectic stupor, which continued till the Thursday morning following; during which period she neither spoke, nor took any nourishment. At that time she roused up, spoke, and swallowed some refreshment, but soon relapsed into the former state; and on Friday evening, the 14th December, she died.

During the whole period, with the exception of October, she menstruated regularly. The pulse, till towards the conclusion, was not affected; there was no increase of heat; the bowels were rather costive, but easily acted upon; and the bladder did its office. At all times, however, the girl laboured under a degree of nervous irritability, unaccountable in a person of such general good health and robust organization.

On Sunday, the 16th December, I opened the head, assisted by Mr. Johnson, of the Royals. On taking off the cranium, the vessels of the dura mater appeared rather more turgid than usual. On removing the dura mater, the pia mater was seen elevated over the right hemisphere by tumor; which, on examination, was found to be a hydatid, about three inches long by two inches in breadth. It was imbedded in the substance of the brain, from which it was very liberally supplied with numerous minute vessels of the size of hairs, which were particularly abundant at the lower part. To its upper surface, a portion of the brain was so firmly attached by the pressure it sustained against the cranium from the increase of the hydatid, that I did not venture to attempt to separate them, and by that portion it was suspended in the glass, and sent to Mr. Cooper. The left ventricle contained a little more fluid than is usually found in a healthy subject; the right had hardly any, being compressed by the tumor. In every other respect the brain was perfect, and exhibited no morbid appearance, except the slight one of increased fulness of vessels.

Of the treatment much need not be said. It was governed by the symptoms, and was sometimes useful in moderating them; but, as must be conceived, it could have no influence in checking the progress of the disease, every period of which was clearly marked by the symptoms of oppressed brain.

Dr. Thomas Young, Physician to St. George's Hospital, saw the case occasionally with me; and gave it as his opinion, in which I fully coincided, that the symptoms arose from some organic affection of the head.

CASE

OF

AMPUTATION AT THE SHOULDER JOINT;

DRAWN UP

By JOHN HENRY CUTTING, M.D.

COMMUNICATED BY

DR. MARCET, FOR. SEC.

Read May 22, and June 5, 1810.

AMPUTATION at the shoulder joint has now been so frequently and successfully performed, as to render it unnecessary to menti[illegible] the result; but it will be seen by the following case, that this operation may be performed with little hazard, under circumstances of the most disadvantageous and appalling kind.

Catharine Coulson, aged 30 years, unmarried, was admitted into Guy's Hospital, under the care of

Mr. Astley Cooper, November 29, 1809, on account of a firm, equable, and immoveable tumor, situated at the upper and external part of the left arm, so high up, that, on a superficial inspection, it seemed to be connected, not only with the humerus itself, but also with the clavicle and scapula, rendering it probable, that it had an attachment to the glenoid cavity of the latter bone. The arm, however, could be moved forwards and backwards; but, in consequence of the weight of the tumor, and the great attenuation, or perhaps even complete obliteration of part of the deltoid muscle, produced by its pressure, the voluntary motion upwards was lost. On minute examination, it was ascertained, that this enlargement arose from the superior part of the humerus; but as symptoms of inflammation of the shoulder joint were present, a doubt still remained, whether the morbid action, which caused its formation, had commenced in those portions of bone which entered into the composition of that part. That the humerus itself was diseased, seemed evident, from an obvious enlargement and irregularity, felt at its inner part; commencing high up in the axilla, and ending about four inches from that point. The circumference of the tumor, at its most bulging part, (the admeasurement being taken parallel with the arm) was $25\frac{3}{8}$ inches; and a line carried round its most prominent part, so as to surround both it and the arm, measured $24\frac{1}{8}$ inches.

This swelling was in general covered merely by common integuments; it was extremely painful when handled, and the skin over it felt much hotter than natural: upon it, many large veins were ramified. Motion of the arm gave considerable pain, which was referred both to the tumor and shoulder joint; and the patient complained much of the weight she had to support. Her appetite was impaired, and she had some degree of fever.

After her admission, the account collected of the commencement and progress of this disease, was the following: About three years and a half previously, after having once struck the summit of the shoulder forcibly against a wall, afterwards fallen on it, and repeatedly received blows on the same part in mangling, she observed a firm tumor, about the size of a nutmeg, at the superior part of the arm. Subsequently to this, she was always affected with pain about the shoulder, when employing the limb freely. The enlargement gradually increased; and about two years and a half before, when it was equal in size to a common tea-cup, she was admitted into Guy's Hospital, by Mr. Cooper. She remained under his care six weeks; during which time repeated blisters were had recourse to, without benefit. In about six months, she again applied for admission, and was re-admitted under Mr. Cooper. The tumor had then attained the size of a pint bason; and the motion of the arm had become less free than on the former occasion, though not so considerably as to prevent the pretty general use of the limb. For this reason, and because her constitution had suffered little, she would by no means consent to the operation of amputation at the shoulder joint, the necessity of which was strongly urged; and, at the expiration of eleven months, she quitted the hospital. Within the year and half antecedent to her last admission, the augmentation of the tumor had been very rapid; but she did not notice the enlargement mentioned to have been observed in the humerus itself, till six or seven weeks previously. Although her nights had been long restless, her general health continued good till the 26th November, when she was attacked with severe pain in the tumor (which felt hot) and about the shoulder, with loss of appetite and languor.

From the period of admission to the 8th December, blood-letting from the veins over the tumor, was twice employed, which diminished the pain and tenderness. The blood was sizy.

As the patient's arm had now become useless, and her sufferings, both from the weight and the symptoms under which she laboured, were very great, she was prevailed on, without much difficulty, to undergo an operation, which was speedily concluded on, and performed on the 8th December. The state of the deltoid muscles, before mentioned, prevented the possibility of executing it in the manner usually directed; for no flap, except of common integuments, could have been preserved. It was concluded, therefore, that the most adviseable plan would be, to aim at covering the wound with those portions of integument and muscles, which anteriorly and posteriorly connected the arm to the trunk of the body.

The first step of the operation, was to secure the axillary artery. An incision, therefore, was made in its direction, high up in the axilla, two ligatures put on it and secured, when a division was made between them. The application of a ligature [illegible] the part of the artery most distant from the heart, was to prevent the possibility of any hæmorrhage from such anastomosing vessels as might empty themselves into it. An incision was next commenced, immediately anterior to the acromion process of the scapula brought forwards, and ended in the axilla, passing just below the end of the artery on which the ligature was applied; and another was carried from the same point posteriorly, and made to meet the former one. The next part of the operation consisted in the gradual division of the muscles surrounding the joint, and the application of ligatures to such vessels as it appeared at all probable might furnish free hæmorrhage. These, being numerous and large, in consequence of the great size of the tumor, it became necessary to secure ten arteries. As a further precaution, also, against any bleeding which might have taken place, either from returning vessels, owing to the circulation kept up by undivided branches of arteries, or from regurgitation, the veins accompanying the axillary and posterior circumflex arteries were tied by two ligatures each, and divided at the intervening space. The capsular ligament being at length laid bare, an incision was made into it, and the cavity of the joint exposed, which was filled with coagulable lymph, of a reddish colour, and gelatinous consistence, mixed with some serum or synovia. The arm being removed, the glenoid cavity was accurately examined, and presented no mark of disease: the internal surface of the capsular ligament was more vascular than natural, but the articulating surfaces were not destroyed. The cartilage was pared from the glenoid cavity, in order to facilitate the process of granulation; and after all hæmorrhage was stopped, the integuments were brought together, and secured in apposition, by three sutures and straps.

The patient underwent the operation pretty well, although she had twice fainted, and was extremely apprehensive previously. Immediately after, she was very restless, and complained much of violent pain of the wrist and elbow of the amputated arm. Her pulse was 108, and rather weak. Thirty drops of tincture of opium were directed; and in consequence of vomiting soon after these were taken, the same dose was repeated. In a short time she became tolerably composed, and lay quiet during the greater part of the subsequent night; but had no sleep till about one o'clock on the following morning. Severe pain, and a sense of pricking, similar to that produced by thorns and thistles, were much complained of, as if affecting the amputated arm. She had much thirst through the night, and slight cough.

On the 9th her pulse was still 108, and she continued to be affected with occasional slight cough: the tongue was rather white, and the thirst remained; but the skin was cool and moist. She still complained much of the pricking sensation; but, [illegible] other respects, felt pretty well. During the night following she had some disturbed sleep.

Her pulse, on the 10th, had risen to 120, but she complained only of the deceptive sensation, and had yet slight cough: the skin was moist. As she had had no evacuation from the bowels since the operation, ℥j of sulphate of magnesia was directed to be given, with a diaphoretic mixture, composed of acetate of potash and mint water, every third or fourth hour. In the course of the afternoon two stools were procured, and the pulse sunk to 108. She rested pretty well during the night.

On the 11th, the pulse was 100 in the morning, but during the day varied from that point to 120; it did not, however, attain the latter point till towards evening, and after she had been [illegible] some friends. Slight cough continued; the [illegible] was pretty clean, the thirst lessened, and the skin moist. She rested ill at night, on account of boisterous weather.

[illegible] the 12th, the pulse varied from 112 to 120. Slight cough still occurred at times. The skin was rather hot and dry; but she felt pretty easy, though numbness of the arm was sometimes much complained of. She slept a little during the day, and had two evacuations from the bowels. There was slight discharge from beneath the straps. A dose [illegible] the diaphoretic mixture mentioned above, without any sulphate of magnesia, was ordered to be given every two or three hours.

On the morning of the 13th the pulse was 128; at noon 120; and in the evening 120, and strong: the cough recurred at times. The skin, however, was less hot, and the tongue pretty clean, nor was the thirst urgent. Towards evening, her face became flushed; she seemed very irritable, and was extremely impatient to have her position changed. Through the day, [illegible] had two stools. No particular pain was complained of about the wound, but the numbness and pricking sensation, as if extending down the arm she had lost, was very troublesome; and the patient was very often impressed with the idea of possessing the ability to move the thumb and fingers of it. The discharge from the wou[illegible] moderate. The mixture was continue[redacted]

The pulse varied on the 14th from 108 to 120. The cough was better; the tongue was pretty clean; she complained of little thirst, and the skin continued in general moist and cool. She had five stools through the day, the two last of which were liquid. The discharge from the wound was still moderate, but the straps were rather offensive.

She was ordered 15 drops of tincture of opium at bed-time, and the straps were moistened with vinegar and tepid water.

On the 15th, the pulse in the morning was 120; in the evening 132, and strong. The cough continued better; the skin was pretty cool, and there was some tendency to sweating. She made no particular complaint, and eat a small quantity of boiled fish with good appetite. In the morning she had three stools; in consequence of which ten drops of tincture of opium were given her. She slept well at night.

The straps were removed. One of the sutures had ulcerated through the skin. Some points of the wound seemed to have united by adhesive inflammation, and granulations had shot from others. There was no pain or swelling, and the discharge was moderate. Two vesicles, probably occasioned by the recumbent posture, had arisen on the skin covering the left scapula, but without any considerable inflammation.

Straps were again applied, to retain the sides of the wound as near as possible together, and a fold of lint placed over them, in the direction of the wound.

The pulse, on the morning of the 16th, was 120; during the day, it got down to 108, and was full: the cough had not wholly ceased, and she still complained of numbness of the amputated arm, as far as the fingers: her appetite was good, and she wished for wine. Had three stools. The discharge [illegible] the wound continued moderate. At night she slept well.

She was allowed to have half a pint of porter daily, and the straps were wetted with vinegar and water, on account of the fœtor.

On the 17th, the pulse varied from 108 to 120. She complained of pain of the left scapula, and still of numbness referred to the arm of the same side. In the morning she had some tormina, which were removed by 15 drops of tincture of opium. She took food and porter with good appetite, and slept well.

The wound was examined, and the granulations appeared healthy. The discharge was more copious than before, and some pus could be squeezed from [illegible] inferior part of the wound. Two ligature[illegible] away, and the sutures were ulcerating through the skin. The cuticle was found to have been rubbed from the blistered part noticed on the 15th.

The wound was dressed as before, and [illegible] the surface which had been blistered, a cloth, wet with vinegar, was applied. The patient was directed to lie more on the right side than before; and in order that she might have fresh air, a window was ordered to be opened at 10 A. M. and shut at 4 P. M. daily.

On the 18th, the pulse in the morning was as low as 90; but in the course of the day as high as 120. Slight cough continued. She complained of nothing, save numbness of the arm. As she had three stools during the day, 10 drops of tincture of opium were taken. The discharge continued moderate. She slept well.

The pulse, on the 19th, was in general about 108, fuller and stronger. She had four evacuations, and took therefore 10 drops of tincture of opium.

The wound was dressed: three ligatures, and the remaining two sutures, were withdrawn. The discharge was moderate, and much diminished from the lower part of the wound. The process of granulation was observed to have advanced, and the rubbed part on the back was healing.

During the 20th, 21st, and 22d, the pulse varied from 96 to 104, and was of good strength. The cough ceased on the former day. She slept well; the appetite was good, and she complained only of the numbness. In consequence of too free evacuations from the bowels, opium was given, under the form of tincture, on the 20th and 21st.

On the 22d the wound was dressed, and had considerably diminished; the granulations looked florid, and the discharge was moderate; two ligat[illegible] were taken away.

On the 23d, 24th, and 25th, the pulse was about 96, and she continued pretty well. On the latter day, the wound was dressed, and two ligatures were removed.

From the 26th to the 28th inclusive, the pulse varied from 92 to 108, and she felt pretty well. On the 28th, the edges of the wound were considerably nearer each other than they had been; the granulations looked well, and the discharge was still moderate; but a small quantity could be squeezed from near the inferior part of the wound, as if from a sinus.

During the 29th and 30th, she continued pretty well, and her pulse was 92. The wound was dressed on the 30th, and looked well.

On the 4th January, in the morning, no change in general symptoms had taken place: the pulse was 96. The wound was less than before: at its inferior part there was a slight red efflorescence on the skin. The discharge was moderate, though rather dark coloured. On the afternoon of this day, she rose, by permission, for the first time since the operation; and had not been up ten minutes, when she was attacked with a sense of fluttering within the chest, and was obliged to return to bed. She had, shortly after, one small and fœtid alvine evacuation (although she had passed a copious one shortly before), and was seized speedily with vomiting of a bitter matter. She slept afterwards, however, pretty well, and sweated through the night.

On the 5th, the pulse was 120; the face somewhat flushed, and the tongue rather foul and dry. She made, however, little complaint, except of pain referred to the amputated arm, which seemed to be placed sometimes posteriorly, and sometimes anteriorly.

One strap was removed, and another cut, so as to ascertain whether any pus was confined beneath them, to produce constitutional irritation; but only a small quantity exuded, and the discharge, on the whole, was moderate.

She was ordered to have sulphate of magnesia, with the diaphoretic mixture, as formerly, and 25 drops of tincture of opium in the evening; but as the former had not operated at night, the latter was not given. She had some sleep.

On the morning of the 6th she had three stools: the pulse was 120, rather full and strong. She had some return of cough; the skin was hot; the tongue dry, and somewhat foul, and there was thirst. She made no other complaint but of considerable pain, as if of the arm. The wound looked healthy; and the three ligatures which remained, were found to be very firm.

Ten drops of tincture of opium were directed to be given every six hours, and the diaphoretic mixture, with sulphate of magnesia, to be repeated. Four straps were applied on the wound, and a poultice over them.

Two doses of the opiate were given, which produced drowsiness, and she rested pretty well.

The pulse was 120 on the morning of the 7th, full and strong; the tongue rather white, but she had little thirst; her skin was moist. She had still some cough. Her countenance was languid, and she complained much of pain, and sense of weight, as if of the amputated arm. Appetite impaired.

Animal food was prohibited, and the opium omitted.

The mixture was repeated, and poultice continued.

During the afternoon of this day she had four stools. She complained in the evening, of sense of heat at the anterior part of the wound; but, on examination, no preternatural appearance was observed. The granulating surface, however, was observed to project beyond, and overlap the straps at two points: these, therefore, were made to pass over, and in some degree compress such exuberant portions. Fifteen drops of tincture of opium were given at night, in consequence of a fifth evacuation from the bowels. She had no sleep till twelve or one o'clock, but slept well afterwards, and sweated.

On the 8th the pulse was 112, intermitting one beat in every 10 or 12. The skin was cool; the tongue rather dry, but no thirst was complained of; and she felt pretty well, although the pain referred to the amputated arm was sometimes troublesome. She was more cheerful, and had some return of appetite.

She was allowed animal food, and the poultice was ordered to be continued. On the following night she slept extremely well.

9th. The pulse was 96, regular and firm; she had slight cough; her countenance was cheerful, and the made no complaint, except of pain as before: her appetite was good, and she had one stool. At night she slept well, and had sweating.

10th. Pulse at 92; the pain continued; the countenance was again languid; the wound looked well.

On the 11th the pulse was 104: she had rested well, and only complained of the usual pain: but the countenance was anxious. As she had had no evacuation by the bowels since the 9th, sulphate of magnesia was given, and one procured. The wound looked well; had diminished, and discharged very little.

An unsuccessful attempt was made, for the first time since the 6th, to withdraw the ligatures.

From the 12th to the 14th, the pulse was at 88, and no other change took place. On the latter day, the ligatures were found to be extremely firmly attached to the parts they surrounded. The poultice was then omitted; and, as she had had no stool since the 12th, the sulphate of magnesia was prescribed.

On the 15th and 16th the pulse was 84, and of good strength; occasional pain of the arm was all she complained of. The wound on the 16th had lessened, and discharged little. The ligatures were still found to be firm.

From the 17th to the 19th inclusive, the pulse was about 80 or 84, and she made little complaint. The upper part of the wound, on the 19th, was nearly covered by newly-formed skin. An efflorescence had appeared round the wound, supposed to have been produced by the straps. The action of the adhesive plaster, therefore, on the parts affected with it, was prevented, by placing lint beneath the straps on each side of the wound. On the 19th she was allowed to quit her bed, and remained up for two hours: she staggered much in walking, but her countenance was natural.

She sat up a good deal on the 21st, but could not stand near a fire without feeling faint. Her pulse was 80; and she made none but the usual complaint. She still felt as if she could move the fingers of the lost extremity, but any attempt to do so, produced a numbness, as if extending up the arm, with pain of the shoulder.

On the morning of the 22d the pulse was 72, and she continued pretty well; but in the evening she had a severe attack of gastrodynia, which was relieved by a dose of tincture of opium and spirit of peppermint: her pulse was 80.

The wound was dressed, and the ligatures could not be withdrawn. As the efflorescence had not diminished, lint, wetted with a solution of acetate of lead, was applied to it.

Nothing particularly worthy of notice occurred from the above period to the 30th, when her pulse was 72, and firm; and she was in general well, though she could not sit within less than six or seven feet of a fire without feeling oppressed. She still complained of pain of the arm. The efflorescence had nearly disappeared.

As the ligatures could not be withdrawn, it was deemed proper to hasten the ulcerative process, necessary for their separation, by artificial means; to one of them, therefore, a small roll of strap was so attached, that it could be readily twisted.

On the 31st December and 1st January she complained of very severe pain of the arm, particularly when the ligature was twisted. Her pulse was 90, and she slept ill.

The strap was cut from the ligature. The pain diminished, and the pulse got down to the natural standard.

On the 5th the ligature, supposed to be that which secured the axillary artery, came away easily.

One of the two remaining ligatures was withdrawn on the 10th; cicatrization had considerably advanced, and the granulating surface of the wound was about two inches long, and at its broadest part, i. e. around the ligature, one inch wide.

After this period, the health of the patient continued to improve; and in a short time she thought herself as well, in general, as ever she had been. The menses, which had been present some days when the operation was performed, recurred six weeks after it, and continued afterwards regular. During the month of March, as the ligature seemed still firmly attached, and any attempt to withdraw it occasioned considerable pain and sense of fulness of the shoulder, and severe numbness, as if extending from the fingers of the amputated arm to the clavicle, an attempt was for some time made to dilate the orifice through which it passed with lint, so that, if possible, its attachment might be discovered and divided. Almost the only part remaining, at this time, to be covered with skin, surrounded this ligature, and was about one inch in length, and $\frac{7}{8}$ths in breadth. No disposition was shewn in it to heal, until subsequently to the 28th of March, when the last ligature was withdrawn. Cicatrization now advanced; and in about three weeks, the formation of the new cuticle was completed. She still is impressed with the idea of having the arm, and that she can move the fingers; attempts, however, at such motion, are always attended with pain, and sense of pricking of the whole extremity; which, as before, when she is in the recumbent posture, feels to be placed over the breast; but when erect, it appears to be placed posteriorly.

Dissection of the Tumor.

The weight of the tumor, including that of the os humeri, was eleven pounds.

The periosteum, in a considerably thickened state, covered the surface of the swelling.

The principal part of the tumor was composed of cartilage, which adhered firmly to the external surface of the bone, and to the inner side of the periosteum.

The bone was much increased in its diameter. Where the tumor was attached to it, numerous processes of bone passed into the cartilaginous matter.

The cancellated structure of the bone was obliterated opposite the disease, and a red pulpy mass was found in the cancelli, at that part at which the otherwise healthy bone joined the diseased

A CASE

OF

TRISMUS,

FOLLOWING

A CONTUSED WOUND OF THE HEAD.

BY J. HARKNESS, ESQ.

SURGEON OF RATCLIFFE.

Read March 30, 1808.

THE following case presenting some peculiarities, which may perhaps be deemed worthy the attention of the Medical and Chirurgical Society, I take the liberty of offering it to their consideration.

Samuel Joyce, a labourer in the West India Docks, received a contused wound on the head with a can-hook, when at work in the hold of a ship on the 27th January last. The wound, which was pretty long, was on the right side of the os frontis, and was cured in about a fortnight, without surgical assistance. About the 20th February, (which was ten days after the healing of the wound) he felt a little stiffness in his jaw, which gradually increased so much, as to make him unable to get more than a small knife into his mouth. At the same time he felt a stiffness or weight in the eyelids, which prevented him from being able to open them readily; and a slight degree of dimness and a want of power over the ball of the eye, which remained to his sensations fixed in his head, and was slightly drawn inwards. The eyelids were for three or four days much swelled. The nose also became somewhat swelled and stiff; and over the whole body, but particularly the loins and pelvis, he had a sensation of stiffness and weariness, such as occurs on taking cold. He was able to work till the 25th, when he applied for my advice, and during that period he was only able to take, as nourishment, milk or any other fluid substance. The symptoms were then nearly as I have described them; but in addition, he began to feel a general stiffness and hardness over almost all his body, but particularly the neck, back, and abdomen, the latter being extremely tense and unyielding. There was in general no dyspnœa, but there were occasional catchings in the breath. For some time, there was considerable difficulty in swallowing, but deglutition was never wholly impeded. He could move his head, but on raising him, the only joint which seemed to be capable of acting, was the hip, and he was lifted as a heavy unyielding mass. He sometimes felt a kind of twitching in the back, and he spoke with labour. His pulse was about 80, and extremely hard, like a piece of whipcord. His body had been open till within a day or two. On the first day, I ordered him a powder composed of five grains of calomel, five of scammony, and 25 of jalap, and directed that ʒss of Tinct. opii should be given every four hours.

On the following day I saw him with Mr. Thomas Blizard, Surgeon to the London Hospital, who attended him with me during the whole course of the disease. We determined upon a very liberal use of tincture of opium, together with the employment of a considerable quantity of calomel, conjoined with scammony, colocynth, gamboge or jalap, and at the same time recommended the patient to take largely of wine and porter.

From the 25th February to the 18th March, he averaged daily ℥i of tincture of opium given in divided doses, and that without any effect upon the sensorium, or the production of pain of the head, acceleration of pulse, or disposition to sleep. The quantity taken in the day was sometimes as much as ℥iss, and sometimes as little as ʒv, but in 16 of the 23 days here mentioned, he took precisely ℥i per diem.

We were not able to act sufficiently upon his bowels till the third day from the commencement of our plan, when he had taken nearly ʒii of calomel, ʒxii of jalap, and ʒxv of scammony, and had besides two purgative glysters administered, nor could we, without the use of large quantities of drastic purges, keep up their action in an adequate degree. In the nine following days, he averaged in the day 40 grains of calomel, 51 grains of extract of colocynth, and 38 of gamboge; and as his mouth then became affected, the calomel was omitted. In the nine succeeding days, he averaged 80 grains of colocynth and 40 of gamboge.

During the whole period from the commencement of this plan till the 20th of March, he averaged rather more than two bottles of wine and six pints of porter in the day.

Under this mode of treatment symptoms of amendment soon began to shew themselves, insomuch that in three or four days from the commencement, he was able to open his mouth tolerably well, and to take his purgative in the form of pill. The tension of the muscles of the neck, back, and abdomen, gave way very gradually That of the abdomen was the last symptom which went off, and when it had slightly abated, the omission of the purgative always created an increase of it. Two or three dark-coloured, but loose, feculent, and fœtid stools, were procured in the course of the day. The affection of the mouth did not take place till the general symptoms were much abated; but we thought it right, in order to ensure, as far as we could, his recovery, to continue the plan as long as any of the symptoms continued, and then only to relinquish it gradually.

At this time he remains weak, but has been entirely free from his complaint for some days past. From the 18th instant we have been gradually diminishing the tincture of opium, the purgatives, the wine, and the porter.

March 29, 1808.

The following Table exhibits the daily amount of each remedy.

TABLE.

	Tinct. Opii dr	Calom. gr.	Jalap dr	Ex. Col. gr.	Gamboge. gr.	[illegible] gr	Wine. Bottles.	Porter. Pints
Feb. 26	8	25	2½			15	[illegible]	
— 27	8	32	4				3	2
— 28	12	48	6				3	6
— 29	5	20	1				3	5
March 1	6	35		36	20		3	7
— 2	7	35		45	25		2	1
— 3	8	40		40	40		1	3
— 4	10	50		48	50		1	3
— 5	8	40		48	40		2	8
— 6	8	40		48	40		2	8
— 7	8	40		48	40		2	8
— 8	8	40		48	40		2	8
— 9	8	40		48	40		2	7
— 10	8			80	40		2	6
— 11	8			80	40		2	7
— 12	8			80	40		2	7
— 13	8			80	40		2	8
— 14	8			80	40		2	8
— 15	8			80	40		2	8
— 16	8			80	40		2	8
— 17	8			80	40		2	8
— 18	8			80	40		2	8
— 19	4			40	20		2	8
— 20	4			40	20		1½	9
— 21	4			40	20		1½	10
— 22	4			40	20		1½	10
— 23	4			40	20		[illegible]	10
— 24	8			10	20		1	[illegible]

The patient, whose case is above related, had no-return of his complaint. His improvement was steady and permanent.

A case of a similar kind was treated, some time since, in nearly a similar way, by Sir William Blizard and Mr. Parkinson, Jun. of Hoxton. Mr. Parkinson has been so good as to draw it up at my request, for the Society.

JOHN HARKNESS.

61, *Broad Street, Ratcliffe,*
April 22, 1811.

A CASE

OF

TRISMUS, SUCCESSFULLY TREATED.

BY MR. JOHN PARKINSON,

SURGEON.

COMMUNICATED

BY JAMES PARKINSON, ESQ.

Read June 18, 1811.

I HAVE the honour to communicate to the Medical and Chirurgical Society, an account of a case of Trismus, in which the treatment adopted bore a considerable resemblance to that which was successfully employed, in a case which Mr. Harkness, of Ratcliffe, some time ago narrated to the Society.

Mrs. D., a lady 50 years of age, of a spare habit, and delicate constitution, received, on the 19th of September, a compound fracture of the leg, for which she was attended by Sir William Blizard and myself. Three weeks after the accident, when the wound had a perfectly healthy appearance, and the bone had acquired a considerable degree of firmness, she was suddenly attacked with pain and stiffness about the back of the neck, a difficulty of swallowing, and an inability to open the mouth to a greater extent than about half an inch. Her pulse was small and weak, and her skin dry, but not hot.

There was no dyspnœa nor abdominal hardness; and a stool, which had been procured the day before, did not present any thing particular in its appearance.

A drachm of tincture of opium was given soon after the accession of these symptoms, which in a short time produced a diminution of the pain of the neck and of the difficulty of swallowing, and a slight degree of relaxation of the muscles of the jaw. She was ordered to take five grains of calomel, and to continue a drachm of tincture of opium every hour.

By eleven o'clock the next morning, she had taken two ounces of tincture of opium without producing any sensible effect, except that of keeping her free from pain in the neck, and producing a slight degree of relaxation of the jaw. It was therefore ordered to be repeated in the same dose, and at the same periods.

The calomel not having, at this time, produced any effect on the bowels, it was repeated, with 15 grains of jalap; but this not operating, another dose was given, with the addition of ten grains of scammony. No operation succeeded till a turpentine glyster, with infusion of senna, was administered, which was given on the second day from the commencement of the trismus, and brought away a considerable quantity of dark coloured and highly fetid fæces.

During the whole of this time, the tincture of opium was continued in the dose of a drachm, at intervals generally of about an hour, but seldom of two hours.

It only procured an hour or two of sleep during the nights, and did not at all affect the sensorium.

Soon after this operation had taken place on the bowels, she was in every respect better; but on the next day, she complained of more stiffness about the jaw, and of a greater difficulty of swallowing, accompanied with considerable pain and tightness about the epigastrium, which felt very hard upon pressure.

No further evacuation having taken place from the bowels, the injection was ordered to be repeated; and a powder, containing gr. vj of calomel, and a scruple of jalap and scammony, to be given every two hours, till a proper effect should be obtained.

After five doses had been given, several copious stools were discharged of the same kind as the first, which procured her immediate relief, as to the pain in the epigastrium, and produced a slight diminution of the other symptoms. The cathartic powders were now repeated regularly every three or four hours, and a drachm of tincture of opium continued every two hours with a very good effect. Under this plan of treatment the symptoms gradually subsided; the strength increased, and the patient was enabled to take more nutriment. The amendment seemed, in a great measure, to depend upon the quantity of alvine discharge; for she was always better on the day, on which the cathartic powders had most effect. They seldom procured less than two copious stools in the day, but sometimes four or five.

At about the fourteenth day from the attack of trismus, she experienced a slight return of pain at the epigastrium, accompanied with occasional difficulty of breathing; both which seemed to arise from her bowels becoming again costive, notwithstanding the free use of cathartic powders. The terebinthinate injection was again had recourse to; and the powder, without the calomel, was repeated every two hours, until a plentiful discharge from the bowels took place, which relieved every unpleasant symptom. The calomel was omitted, in consequence of a slight ptyalism having come on.

For a week longer, the powder was given every three or four hours, without the calomel and the tincture of opium, in the quantity of a drachm every two or three hours.

The tincture of opium was found absolutely necessary to keep off a general uneasiness and restlessness, which had hitherto never failed to come on, when it had been occasionally omitted for five or six hours.

At the expiration of three weeks, the tincture of opium was gradually diminished ; and, after a few days, it was found necessary only to give it at night. The bowels now began to resume their natural action, and only required the occasional use of the cathartic.

In five weeks her health seemed to be completely re-established. The only inconvenience she experienced, was from the continuance of some degree of stiffness of the muscles of the jaw, which still occasioned a slight difficulty in opening the mouth, and which did not entirely go off for many weeks afterwards.

OBSERVATIONS

ON

TUMORS WITHIN THE PELVIS,

OCCASIONING DIFFICULT PARTURITION.

By H. PARK, Esq.

SURGEON AT LIVERPOOL.

COMMUNICATED BY

Dr. YELLOLY.

Read Jan. 18, 1811.

AS I have reason to believe that tumors within the female pelvis, occasioning difficult parturition, are not of very frequent occurrence, I hope it will not be altogether useless to young accoucheurs, if I communicate some account of the few that have fallen under my observation. I can at least say, that I should have been happy to have possessed, 30 or 40 years ago, the information they have afforded me; although, perhaps, by that assertion, I shall only prove myself culpable, for having been devoid of sufficient knowledge of the subject before these cases occurred.

The first case of this kind I saw, was somewhat more than 20 years ago, in a poor woman, under the care of Mr. Peacock, surgeon of this town, in conjunction with my friends and late colleagues, Dr. Lyon and Mr. Alanson. She had been in labour quite as long as we thought it safe to trust to the natural efforts, without the head being able to descend at all into the pelvis. Owing to a tumor, situated between the vagina and rectum, of a globular figure and firm texture, which left but very little space between this tumor and the pubis, we soon determined to open the head, and endeavour to deliver by the crotchet, which was effected without any very great difficulty. I, however, now think we were blameable for adopting that determination, without first attempting to diminish the bulk of the tumor. After delivery, we were somewhat surprised to find that the tumor had totally disappeared; and were divided in our ideas of the cause, viz. whether it had been some kind of hernia, which had receded as the child got below it; or whether it was a tumor of the encysted kind, that had been ruptured by the force of bringing down the head. I inclined to the latter opinion, and thought I could feel an orifice near the central part of it. I learned that the poor woman had more children afterwards, without any recurrence of the tumor.

The next case was that of Mrs. S——, whom I was engaged to attend in her first confinement. On my first examination, I found the pelvis nearly filled by a tumor similar to the last-mentioned, of a very firm texture, situated between the vagina and rectum. It was with some little difficulty I could pass the finger between the tumor and the pubis, so as to reach the os internum, till it became a good deal dilated. I almost despaired of this delivery being accomplished by the mere efforts of nature. In this, however, I was agreeably deceived; Mrs. S—— was delivered naturally of a living child, though not without a very severe struggle of a great many hours' duration. After this she had four miscarriages and premature births in succession, each time of twins, from the fourth to the end of the seventh month. The seven months' children were the last of the four; and these were likewise born without any forcible measures.

During these pregnancies the tumor, by its pressure on the urethra, frequently occasioned retention of urine, so as to require the use of the catheter, although I could not, by the touch, discover much change in its bulk. In one of these attacks, I was a good deal foiled in my attempt to introduce the catheter; when, on forcibly pressing back the tumor with two fingers, the urine flowed without the assistance of the instrument. I therefore instructed her husband to do this; and she had no farther occasion for my attention on that account.

In her next pregnancy she went on to her full term, of a single child, and it was in this labour we were called upon to take some decisive measures respecting the tumor; for, after the os internum was fully dilated, and the membranes ruptured, she passed the whole night in most severe labour, without the smallest advantage; the head constantly pressing on the upper part of the tumor, but without being able to descend into the pelvis in the smallest degree. In this, as well as in the last labour, I had the assistance of Dr. Lyon; and, after some deliberation, we agreed to make an incision, in a very cautious manner, into the tumor, which, from Dr. Lyon's apprehension of hernia, was preferred to a puncture with a trocar. The instrument I employed was the lancette cachée, used in pharyngotomy; with which, conducted on my finger to a part which I thought felt thinner than the rest, I made three or four slight scratches, till I thought the parietes felt thin; and then, by pressing my finger stronger on the part, I forced it into a large cavity, which felt as if it was filled with a very gelatinous fluid. In this, however, I was deceived, for it proved a bloody serous fluid, with a number of flakes of membranous substances, resembling the strippings of tripe; some of these were as large as a quarter of a sheet of common paper. The tumor was completely evacuated by the next pain; and in two or three more the child was expelled. Mrs. S—— recovered but very slowly from this delivery. A very considerable discharge ensued from the incision, which engaged so much of her attention as considerably to deprive her of sleep; and was so offensive as to be perceived immediately on opening the outer door of the house, accompanied with a good deal of pain in the loins, debility, and symptomatic fever.

These continued, with little abatement, nearly three weeks; and, with gradual decrease, seven or eight weeks more, before they entirely ceased, and her health became restored. It appeared afterwards, that the healing of this tumor, and consolidation of its cavity, must have occasioned a considerable degree of stricture; for in her next labour, after the os internum was fully dilated, and the membranes ruptured, strong labour pains, of seven or eight hours' duration, were required to force the head through the pelvis. And in the labour again succeeding to that, which proved an arm presentation, about the end of the eighth month, I found a considerable resistance to the passage of my hand, in search of the feet, made by a stricture, which evidently was not the os internum.

The next case was a poor woman in Shirkdale, about two miles from Liverpool, whom I was desired to see, in conjunction with Dr. Lyon, and who had been two days in labour, attended by two of the younger surgeons of this town. We found the difficulty to arise from a considerable tumor, situated like those already described, filling up a considerable part of the pelvis, but of a less firm texture, and not so globular, being of a more irregular oblong figure. The woman's strength was not very much exhausted, and the head pressed more into the pelvis than in either of the former cases. We therefore gave it as our opinion, that they might safely give nature a longer trial; and that the woman might easily be delivered by the crotchet, if it should become necessary, not deeming this a case in which it would be eligible to hazard an incision. We learned, however, that she was delivered by the mere efforts of nature on the following day; but were afterwards much concerned to hear, that she died of vomiting and constipation about three days afterwards, which information we did not obtain till some days after her interment, otherwise we should have been very desirous to have inspected the body. We conceived it not improbable that this might have been a case of intestinal hernia.

My fourth case was one in which I was consulted by a surgeon, who had been attending the poor woman nearly three weeks, for what he had conceived to be a retroverted uterus, and had made some ineffectual efforts to reduce it. The mistake was easy to be made, there was so much similarity in the symptoms, viz. considerable pains in the hypogastric region; much forcing down, with difficulty in voiding urine and fæces; a large round tumor seated between the vagina and rectum, and the os tincæ situated close to the os pubis, and so high as to render it rather difficult to reach it. The poor woman had missed her menstrual periods about three months. The surgeon had repeatedly introduced the catheter without finding any quantity of water, and without giving any relief. Before he spoke to me, he had consulted Mr. M'Culloch, a more experienced accoucheur, and of more accurate discernment, who had told him he thought he was mistaken in his idea of a retroversion of the uterus. On examining, I was clearly of Mr. M'Culloch's opinion; the os tincæ, though close to the upper edge of the symphysis pubis, was in its natural direction, as much as the pressure of the tumor would admit, pointing downwards, not forwards; and the length of the cervix proved that the uterus was not impregnated. The finger could not be passed up at all behind the tumor. A few days before I saw her, she had had rather a copious discharge of blood per vaginam, but without any relief. The poor woman's health and strength were declining very fast from her sufferings; and it was evident she could have no relief, unless this tumor could be either dislodged or diminished. I attempted the former, by introducing all my four fingers and palm of the hand, but without the thumb, and attempted to raise it. The resistance was rather considerable, and the woman complained a good deal; but I thought the tumor yielded, and I increased the force notwithstanding her complaints, by which I raised it completely above the brim of the pelvis. She said she thought something burst within her, but I was much inclined to believe it was merely breaking some adhesions the tumor had formed. She was much relieved; and very soon after this reduction, her evacuations by urine and stool became easy and natural. Five days afterwards she was attacked with vomiting and diarrhœa, after which her health daily improved; and the event proved that she had not been pregnant. What would become of this tumor, in case she should prove pregnant, may be a matter of considerable uncertainty.

My fifth case was one to which I was called by Mr. Chyers, a very judicious and experienced accoucheur, of Prescot: the patient resided in West Derby, about half way between Liverpool and Prescot. The woman had been a considerable time in labour, till very much exhausted, yet making very little progress indeed. A tumor, very similar to those of my first and second cases, but not quite of so firm a texture as that of Mrs. S——, filled the pelvis so much as to keep the head up almost out of the reach of the finger, and to have rendered it extremely difficult to have delivered by the crotchet, provided no other means could have been devised. It was therefore immediately determined to make an incision in the same manner as with Mrs. S——, which was done, but with a different result. No cavity was discovered; nothing discharged but blood; nevertheless great advan-.

tage was gained, for the head immediately dropped nearly two inches, so as to render it easy to deliver by the crotchet, if necessary. Mr. Chyers was therefore left to his own discretion. He waited several hours; when finding that the natural efforts gained him no farther advantage, that the draining was considerable, and his patient in a sinking state, he perforated the head, and delivered in about three hours. The woman recovered without much difficulty; and Mr. Chyers informs me that she has had another child, of which her delivery was so expeditious, that they had not time to send for him.

My sixth and last case is that of Mrs. C——, a lady between 30 and 40 years of age, whom I am now attending in her first confinement. On my first examination, on the morning of Wednesday the 22d May, I found a tumor very similar to that in the last-mentioned case, except that I felt more confidence of its containing fluid. It filled the pelvis so completely, that I did not, at that examination, reach the os internum at all. In the evening, after slight pains had continued all day, I reached it, with some little difficulty, above the symphysis pubis, and found it dilated just enough to admit one finger, and could feel the head presenting. That night passed over with little alteration, and the whole of the next day without much more. Very strong pains then came on, and continued the whole of Thursday night, which dilated the os internum to the diameter of about three inches, which seemed to be all the natural efforts could do; the membranes were ruptured, but the head could not descend, nor produce any farther dilatation, but rested, on the top of the tumor and the upper edge of the pubis, in which latter part it occasioned a most acute sense of pain. I now advised Mr. C. to take another opinion, before I proceeded to any farther measures; on which my friend and late colleague, Mr. Alanson, was consulted, and agreed with me in thinking the tumor contained a fluid, and in the propriety of opening it, if the natural efforts did not soon produce a better effect. Soon after this the pains changed very much for the worse, becoming distressingly acute, but wholly irregular and spasmodic, without any thing like regular effort. Large doses of opium were given through the day; and in the evening the regular forcing pains returned, when I determined to make an opening into the tumor, at first only by puncture, but more, if found necessary. This, however, proved sufficient; the contained fluid, which appeared to be merely a bloody serum, drained off so as to render the tumor quite flaccid, and to diminish its bulk at least two-thirds, and as the head descended into the pelvis, it became totally evacuated. Immediately after the puncture was made, the head began to dip into the pelvis, and to dilate the os internum more fully; but the child proving a large one, it required eight hours more of strong labour to complete the delivery, although the tumor could not oppose any farther resistance. The long pressure on the head destroyed the child. It is now the ninth day from delivery, and Mrs. C—— has experienced no farther consequences from her hard labour, than some pain and difficulty in passing her water, owing to the long pressure of the head on the pubis, and this has now nearly subsided. She has not any such discharges as followed in the case of Mrs. S——, but merely such as are common to all women at this period.

CASE

FRACTURED CRANIUM,

WHERE THE DURA AND PIA MATER WERE LACERATED, AND A GREAT QUANTITY OF THE CEREBRUM PROTRUDED, WHICH TERMINATED FAVOURABLY.

BY P. T. CREAGH, ESQ.

SURGEON OF THE ROYAL NAVY.

COMMUNICATED

BY H. L. THOMAS, ESQ.

Read Jan. 29, 1811.

His Majesty's Ship Hind, off the Island of Milo, Archipelago, Nov. 20, 1807.

THOMAS RIGGS, a seaman, belonging to his Majesty's ship Seahorse, was received on board of this ship, at nine o'clock this morning, out of a Turkish prize, captured by the Seahorse, some days ago, off Candia, afflicted with the following wounds, which he received about ten o'clock last night from some of the foreign prisoners, who had endeavoured to assassinate our men, and retake their ship.

The two ossa parietalia were considerably injured, particularly the left, and the following fractures were traced in different directions.

1st. A large fracture was found running from about the middle and superior portion of the left parietal bone, backwards and downwards, towards the lambdoidal suture.

2d. A second fracture extended from near the origin of the latter fracture, directly across the sagittal suture, and embracing about two inches and a quarter of the right parietal bone; a fissure extended farther on into the same bone.

3d. Another line of fracture began one inch and a quarter from the origin of the latter, backwards, crossing the sagittal suture, and almost communicating with the second fracture in the right parietal bone, forming nearly an obtuse angle.

4th. A fourth fracture extended from the origin of the first, running forwards and downwards, towards the left side.

A considerable portion of the right parietal bone was forced up about its center by an oblique blow, made by a cutting weapon, beginning from below upwards. This injury, from the depth and direction of the probe, appeared to extend to the inner table of the cranium.

5th. Another fracture extended from a little above the middle of the left orbit, obliquely upwards and backwards, towards the left side. This fracture was made by a cutting weapon, in a perpendicular direction.

[illegible] the origin of the first fracture, as I have called it by way of distinction, the cranium was shattered into several pieces; one splinter penetrated the dura and pia mater, and dipped deep into the substance of the brain itself, which made way afterwards for a vast deal of that substance to protrude, and to ulcerate.

After shaving the head, I examined minutely the nature and degree of the injury received; and tracing the fractures to their origin, I removed such portions as were loose, and two that were compressing the brain, and I elevated others on a level with the uninjured cranium. All the clotted blood being removed, the membranes dressed, and adhesive plasters applied to prevent the scalp from retracting, he was let blood, took a saline cathartic draught, and was put to bed. He remained quiet all the day, but became a little restless towards evening, and in consequence took a draught, with gr. xxiv. of Tinct. Opii.

November 21.—He is apparently better this morning, but he was occasionally disturbed with rigors in the night; in other respects he passed it quietly; has had one evacuation.

Injiciatur enem. commun. h. s.

P. M. He spent the day very quietly; was much inclined to doze; has had only two loose stools since he was wounded; pulse quicker; heat increased. I removed the dressings. From the parts whence the bones were taken away, there is a good discharge from the surface, and the substance of the brain protrudes.

Habeat haust. salin. in actu effervescentiæ tertiâ quâque horâ.

℞. Extract. colocynth. comp. gr. i. Calomel. gr. iv. ft. pilul. N°. vi. horâ somni sumendæ.

22d.—He passed a quiet night, and had one evacuation this morning; pulse 78; he is very sensible to all that is done about him; discharge as before.

23d.—Spent a restless night; complained frequently of his head, and of a severe pain shooting across his forehead. The pulse is full, and harder than before.

Emittantur sanguinis ℥ xij Repet. haust. salin. & pil. colocynth. circa meridiem.

P. M. He experienced great relief from the bleeding; passed the remainder of the day very quietly; has had no evacuation since yesterday.

24th.—Passed a tolerably quiet night; had one copious loose stool this morning; there is a good discharge from the wounds; the pain of the head and eyebrows continues; skin perspirable; has an inclination to doze.

P. M. Pain continues severe.

Repet. pil. colocynth. superbibendo infus. sennæ tartar. ℥iij.

25th.—At 9 A. M. pain of the head and eyebrows is increased; there is a copious discharge from the wounds; had three evacuations early in the morning; the paralysis of the arm continues, and a partial one of the same side, and of the lower extremity has taken place; great propensity to sleep, with an astonishing degree of stupidity and wildness of countenance. The cerebrum protrudes through the ruptured membranes; the eyes are somewhat fixed, and the pupils rather dilated. A portion of the left parietal bone, passing backwards and downwards, having risen above the level of the sound cranium, and in other parts being apparently depressed, I was led to suppose this to be the cause of the present distressing symptoms. Accordingly I enlarged the wound, and, with the head-saw I began to remove a longitudinal portion. After some time, I discovered that the entire fractured piece might easily be taken away from its loose attachment; I therefore raised the scalp, and brought away a large piece of bone, under which and upon the dura mater, lay a thick layer of coagulated blood, firmly adhering to this membrane. After removing this coagulated blood, I applied a thin intervening dressing, and brought the scalp as near as possible to its neighbouring skin.

Seven P. M. He is much better. The pulse is increased in fulness and frequency.

Emitt. sanguinis ℥ xij. ℞ Haust. salin. cui adde tinct. opii gutt. gr. xxiv. horâ somni sumend.

26th.—He passed a quiet night. The dura mater, laid bare yesterday, exhibits a healthy aspect. The cerebrum protrudes; there is a good discharge from the wounds; pulse 74, and irregular; tongue moist; speaks incoherently at times; there is a slight inclination to nausea; takes no medicine, but has a nourishing diet.

27th.—There is a good discharge from the sores; a slight pain of the head remains; pulse 77, and irregular; eyes somewhat dilated, but sensible to the approach of light.

P. M. Appears worse this evening: has had several attacks of muscular distortion of the face, there is a profuse discharge from the wounds.

Habeat pulv. ipecac. comp. gr. x. tertiis horis.

28th.—He took two doses of the powders, and brought up the third; appears more tranquil this morning; pulse 77; a good granulation begins to spring up from the dura mater; nourishing diet continued; mutton broth, &c.

Repet. horâ somni pilul. colocynth. ut antea.

29th.—He appears cheerful, and is perfectly sensible; discharge as before; the substance of the brain continues to protrude; the aperient pills have not yet operated.

P. M. Pain of head continues.

November 30th.—The appearance of the sores and of the discharge is good, and granulations are rising fast; his aspect is, nevertheless, very unfavourable; he is much inclined to doze; he will not take any nourishment, and appears lethargic; a little Port wine was allowed him.

P. M. Every symptom of approaching dissolution seems to advance rapidly; has not taken any nourishment since morning, excepting a very small quantity of wine with water.

Applicet. Emp. Cantharid. nuchæ colli.

December 1st.—He spent a bad night; had three different attacks of convulsive tremors about three o'clock this morning; is much inclined to doze, and is at times in a comatose state; the breathing is very low and interrupted; the convulsive tremors have returned; the paralytic affection of the side and lower extremity has considerably increased; pulse low and frequent; and he is no way affected by the approach of a strong light. From these symptoms, I was sure that more of the cranium required to be taken away. Accordingly I removed a portion of the fourth fracture in the left parietal bone, nearly of a triangular shape, which admitted of another bone being raised. The removal of this bone made room for the free exit of serous fluid, and coagulated blood that lay underneath the bone, upon the dura mater; and the removal of this bone also exposed entirely the ruptured membranes, with the cerebrum protruding through, and a portion of the longitudinal sinus. After removing the extraneous fluid, he was simply dressed, and put to bed.

2d.—He passed a quiet night, but slept very little; skin hot; pulse 77; about a tea-spoonful of the brain protruded.

P. M. No change.

Repet. horâ somni haustus salinus cum opio.

3d.—His sleep has been more friendly durin night, and every symptom is more favourable; slight ulceration on the surface of the cerebrum has taken place, with considerable motion of that viscus, similar to the pulsation of the arteries; the paralysis of the side is seemingly less; the discharge lying on the surface of the brain was removed, by introducing a little clean sponge with a pair of forceps, and lint afterwards; takes no medicine.

6 P. M. Slept for about three hours during the day; appetite improves, and he had one evacuation; pulse natural; skin moist.

Repet. haust. salin. cum opio.

4th.—There is no particular change this morning.

5th.—The appearance of the sores continues favourable, and no bad symptom has intervened. The pulsating motion of the brain is very slight in the morning, but increases towards evening. Takes mutton-broth, and sago and tea.

6th.—He appears very low and languid; has had no evacuation these two days past; appetite is worse; pulse 77; a little wine is mixed with his sago.

Repet. pilul. colocynth. C. ut antea.

P. M. Had one loose stool.

7th.—He passed a quiet night; seems very low; there is a good discharge from the external wounds, and the cerebrum protrudes as usual; feels no pain of the head. There is a profuse discharge from the wounded os frontis, and the bone is denuded of its pericranium; the fracture is sufficiently wide to allow of a free exit of any fluid that may collect within; the dura mater can be felt with the probe; the fractures crossing the sagittal suture are also discharging healthy pus; the fractured portion of the right parietal bone can be easily moved up and down; but as it in no way compresses the brain, I did not think it right to remove it. Dressings as before; takes as much of the decoction of bark as will lie upon his stomach; has an egg every morning.

8th.—He has been very uneasy all night and this morning; looks wild and melancholy; pulse natural; skin cool; the paralysis of the side has almost left him, and the lower extremity feels better; the arm continues without any sensation or muscular motion; bark continued as before.

Repet. pilulæ catharticæ.

9th.—Passed a quiet night; had two loose stools. The healthy discharges continue; appetite improves; pulse natural; the febrile symptoms which threatened to rise last night, have disappeared. The cerebrum, as seen through the ruptured membranes, is of a bright red colour, and healthy granulations are shooting up from all parts of the dura mater. Mutton broth, and a little mutton, for dinner.

10th.—The aspect of the sores is very favourable, excepting the ruptured membranes of the brain, which appear dark and sloughy. The pulsating motion of the brain increases towards evening.

All the functions are natural; he has recovered the use of his side, and almost of the lower extremity. Bark is given freely.

11th.—The ulcerating process of the cerebrum has increased; the other parts remain as they were: dressed twice a day.

12th.—The ulcerating process has dipped deeper into the substance of the brain, and the increased discharge is removed by a little sponge and dry lint, and afterwards by spreading a little dry lint over the surface, to remain there for the night, and absorb whatever fluid may be secreted. The appetite is very keen, skin perspirable, belly rather costive; rich nourishing diet is given him often, but in small quantity.

P. M. The cavity in the cerebrum, which is very conspicuous in the morning, fills up considerably towards evening, although no perceptible velocity takes place in the pulse.

13th.—That part of the dura and pia mater which is seen through the ruptured membranes, has contracted a very firm adhesion to the cranium; the cerebrum is of a bright red, and has a glandular appearance. Repet. pilul. colocynth. ut antea.

14th.—The discharge is very copious from the fifth fracture, and granulations are rapidly embracing the edges of the ruptured membranes, which it was necessary to check, to allow a free exit for the discharge from the cerebrum beneath. This discharge, however, continues to lessen, and the glandular appearance is more distinct, with considerable irregularity of surface. Has had two evacuations since morning, feels no pain, pulse 73, appetite is very good; has mutton and fowl broth for dinner, one egg and a basin of tea for breakfast. As he expressed a great desire for wine, I indulged him with a wine glass full at noon.

15th.—Appearance of the cerebrum as yesterday; the cavity, which is very conspicuous in the morning, lessens very perceptibly towards evening. There is a very good discharge from the fractures; the bark decoction is continued.

16th.—After removing the dressing early this morning, a quantity of serous discharge escaped from the cerebrum very little discoloured. All functions natural; appetite very keen; he feels no uneasiness whatever: the pulsating motion of the brain does not correspond with the pulse at the wrist.

17th.—There is very little discharge from the cerebrum, and this is almost serous. Arrived at Malta, and were put under quarantine.

18th.—He is very cheerful; the discharge from the cerebrum is very small in quantity, and of a serous nature; the wounded os frontis discharges freely.

19th.—Discharge from the cerebrum as before; a little lint was introduced to absorb it; he passed a good night.

4 P. M. I removed the dressings once more; and as the membranes have adhered very firmly by granulations, I thought best to suffer them to remain so, particularly as the discharge from the cerebrum was very small in quantity in the morning; the discharge from the other sores is very favourable.

Sent my patient to the Naval Hospital at Malta.

I need not observe, that the strictest regularity of general regimen was most rigidly adhered to, and every possible precaution taken to exclude the admission of the atmospheric air. A great deal must, however, have come in contact with the surface of the brain daily.

General warmth was attended to from the beginning, pledgets of fine tow being applied over the dressings, and flannel and linen night-caps over all. Care was taken to cause regular evacuations to take place, keeping the body at rest, and abstaining from every kind of medicine and nourishment that could excite the slightest sensation of nausea, as I observed that this always increased the pulsating motion of the brain. I trusted chiefly to nourishing diet, repeated as often as prudence would admit.

Here ends the relation of the general symptoms and treatment of this patient's case, while he was under my care. While I remained in harbour, I visited him daily; he continued to recover strength and appetite; the sores healed kindly; no further discharge took place from the cerebrum, the ruptured membranes having remained united from the 19th. Gentle exercise was recommended by Mr. Allen, the Surgeon to the Naval Hospital, and a bottle of porter daily, which was the only alteration he made in the plan of treatment pursued by me. After the sores had healed, and the paralytic affection had left him, he was invalided and sent to England.

I cannot take on myself to say the quantity of brain that protruded and ulcerated; but owing to the length of time that the brain was protruding, and the increase of the pulsating motion of the cerebrum as the vacuum increased, together with the appearance of the hollow space when most conspicuous, I am persuaded the loss could not be less than a large egg full and a half, and I am inclined to believe it much more.

P. T. CREAGH, Surgeon,
Royal Navy.

No. 9, *Panton Square.*
9 *Dec.* 1810.

SOME OBSERVATIONS

ON

SPINA BIFIDA.

By ASTLEY COOPER, Esq. F.R.S.

SURGEON TO GUY'S HOSPITAL.

Read May 21, 1811.

I PROBABLY should not have read to the Society the following remarks on Spina Bifida at the present time, had not I been urged to it by those on whose judgment and friendship I have been accustomed to rely. The cases which form the basis of this paper having been shewn to Drs. Marcet, Yelloly, and Farre; to Mr. George Young, and to Mr. Barlow of Blackburn; they were of opinion that they not only deserved publication, but strongly urged that they ought not in justice to remain concealed, as there were, probably, many children at this time in the kingdom who labour under the disease in a state to admit of remedy, and whose lives might fall a sacrifice to withholding this communication from the public. Nor will it, I trust, be considered that I am publishing precipitately, by those who will give themselves the trouble to visit the cases which I am now about to describe, as they will find that one has been under my observation for four years, another two years and a half, and the third for the space of eighteen months; so that a considerable time has been allowed to watch the effect of the treatment which is here recommended.

CASE I.

James Applebee, Baldwin Street, Old Street, was born on the 19th May, 1807, and his mother immediately after his birth observed a round and transparent tumor on the loins, of the size of a large walnut.

Mr. Deering, who was her accoucheur, requested Dr. Petch to see the child with him, who informed the mother of the dangerous nature of the complaint, and of the probability of its fatal termination.

On the 22d June, 1807, the child was brought to my house, and I found that although it had spina bifida the head was not unusually large; that the motions of its legs were perfect, and its stools and urine were discharged naturally.

I applied a roller around the child's waist, so as to compress the tumor, being induced to do so from considering it as a species of hernia, and that the deficiency of the spine might be compensated for by external pressure.

The pressure made by the roller had no unpleasant influence on its voluntary powers; its stools and urine continued to be properly discharged, but the mother thought that the child was occasionally convulsed.

At the end of a week, a piece of plaster of Paris, somewhat hollowed, and that hollow partly filled with a piece of liht, was placed upon the surface of the tumor: a strap of adhesive plaster was applied to prevent its changing its situation, and a roller was carried around the waist, to bind the plaster of Paris firmly upon the back, and to compress the tumor as much as the child could bear.

This treatment was continued until the month of October, during which time the tumor was examined about three times a week, and the mother reported that the child was occasionally convulsed.

When the child was five months old, a truss was applied, similar in form to that which I sometimes used for umbilical hernia in children, and this has been continued ever since.

At the age of fifteen months it began to make use of its limbs; it could crawl along a passage, and up two pair of stairs.

At eighteen months, by some accident, the truss slipped from the tumor, which had become of the size of a small orange, and the mother observed, when it was reduced, that the child appeared in some degree dull; and this was always the case if the truss was left off for a few minutes, and then re-applied.

At fifteen months he began to talk; and at two years of age he could walk alone.

He now goes to school, runs, jumps, and plays about as other children. His powers of mind do not appear to differ from those of other children. His memory is retentive, and he learns with facility. He had the measles and small-pox in the first year, and the hooping-cough at three years. His head, previously and subsequently to the bones closing, has preserved a proper proportion to the other parts of his body.

The tumor is kept by the truss entirely within the channel of the spine; but when the truss is removed, it soon becomes of the size of half a small orange. It is therefore necessary that the use of the truss should be continued. When the truss is removed, the finger can be readily pressed through the tumor into the channel of the spine.

CASE II.

January 21st, 1809, Mrs. Little, of No. 27, Limehouse Causeway, brought to my house her son, aged ten weeks, who was the subject of spina bifida.

The tumor was situated on the loins; it was soft, elastic, and transparent, and its size about as large as a billiard ball when cut in half; his legs were perfectly sensible, and his urine and fæces were under the power of the will.

The child was taken to a surgeon of eminence, who said that nothing could be done, and that the child would not live more than four or five months, and ordered the swelling to be washed with vinegar and water.

Having endeavoured to push the water contained in the tumor into the channel of the spine, and finding that, if the whole was returned, the pressure would be too great upon the brain, I thought it a fair opportunity of trying what would be the effect of evacuating the swelling by means of a very fine pointed instrument, and by subsequent pressure to bring it to the state of the spina bifida in Applebee's child.

I therefore immediately punctured the tumor with a needle, and drew off about two ounces of water.

On the 25th of January, finding the tumor as large as before it had been punctured, I opened it again, and in the same manner, and discharged about four ounces of fluid. The child cried when the fluid was evacuated, but not whilst it was passing off.

On January 28th, the tumor was as large as at first. I opened it again, and discharged the fluid. A roller was applied over the tumor and around the abdomen.

February 1st, it was again pricked, and two ounces of fluid discharged.

On the 4th, three ounces of fluid were discharged.

On February 9th, the same quantity of fluid was evacuated as on the 4th; but instead of its being perfectly clear, as at first, it was now sanious, and it had been gradually becoming so in the three former operations.

On the 13th, the same quantity of fluid was taken away; a flannel roller was applied over the tumor and around the abdomen; a piece of pasteboard was placed upon the flannel roller over the tumor, and another roller over the pasteboard to confine it.

On the 17th three ounces of fluid, of a more limpid kind, were discharged; the pasteboard was again applied.

On the 27th the surface of the tumor inflamed; the fluid, not more than half its former quantity, was mixed with coagulable lymph, and the child suffering considerable constitutional irritation, was ordered calomel and scammony, and the rollers were discontinued.

February 26th, the tumor was not more than a quarter of its former size; it felt solid; the integuments were thickened, and it had all the appearance of having undergone the adhesive inflammation.

On the 28th it was still more reduced in size, and felt solid.

On March the 4th it was in the same state as on the 28th of February.

March the 8th, the swelling was very much lessened; the skin over it thickened and wrinkled; a roller was again had recourse to; a card was put over the tumor, and a second roller was applied.

March the 11th, the tumor was much reduced; the skin covering it was a little ulcerated. On the 15th it was flat, but still a little ulcerated.

On the 27th the effused coagulable lymph was considerably reduced in quantity, and of very firm consistence.

On the 2nd of May nothing more than a loose pendulous bag of skin remained, and the child appearing to be perfectly well, the bandage was soon left off.

On December the 18th it was attacked with the small-pox, and went well through the disease.

The skin now hangs flaccid from the basis of the sacrum; its centre is drawn to the spine to which it is united, and thus the appearance of a navel is produced in the tumor by retraction of the skin.

The pricks of the needles are very obvious on each of the punctured parts of the tumor, forming slight indentations.

My friend and neighbour, Dr. Yelloly, saw the progress of the cure in this child, it being from time to time sent to his house.

CASE III.

January 1810, Hannah Jackman, aged eleven days, was brought to my house with spina bifida, having *an ulcerated state of the skin over it.* The woman had been delivered by Mr. Rosewarn, a pupil of Dr. Haighton's, and Dr. H. had seen the child.

Jan. 5th, the tumor was punctured with a needle, and the fluid was discharged.

Jan. 9th, the tumor was filled with coagulable lymph, as was proved by its inflamed appearance, and the firmness of its feel; the child appeared in great pain, had no stool, and suffered considerable constitutional irritation; it was ordered a dose of calomel and a glyster.

On the 10th it had evacuations both by stool and urine, and on the 11th Mr. Rosewarn reported that the tumor was less in size; that it was still solid; that the child was considerably torpid, but suckled heartily.

On the 13th the ulcer in the spina bifida was almost healed; the tumor was flaccid; convulsions which had begun on the evening of the 11th had been frequent to the 13th; the child foamed, struggled very much, and seemed very weak.

On the 16th my assistant, Mr. Lewis, saw the child, and reported that the convulsions ceased on the 15th; that the child was much reduced, and that it was costive; the tumor was nearly level with the surrounding skin, soft, and of a red colour; it had still a small ulcer on it. Glysters were directed to be given.

Jan. 19th, the tumor had become very small, and but a trifling ulcer remained. The child, however, was convulsed; its eyes were drawn under its upper eyelids; it was much reduced; it had retention of urine for a day and a night, and was extremely costive; it had ceased to suck for several days, but began to take the breast again on that morning.

Jan. 23d, the child sucked heartily; the tumor appeared to contain some fluid in its centre; the ulcer upon its surface was healthy, and nearly healed.

Jan. 26th, the tumor was somewhat increased; the child sucked, was free from convulsions, and improved in strength.

February 3d, the ulcer was healed; the tumor was much reduced, and the child greatly improved in its strength.

The child was again brought to me on the 13th, at which time the adhesive inflammation appeared to be complete. On the 15th of the same month it was seized with convulsions, which continued until the 24th; its eyes became inflamed on the 13th, and continued so until its death, and it died on the 25th of February.

Inspection on the 27th.—The bones of the cranium were very much separated at the sutures; there was no hydrocephalus externus; the brain was unusually soft; the ventricles contained about six ounces of a limpid fluid, but there were clots of coagulable matter floating in it.

In the preparation which I have now the honor to shew to the Society, it will be seen that the adhesive inflammation is very complete, so that no cavity is left for the reception of the spinal fluid. See the Plate.

CASE IV.

—— Sterney, son of Mr. Sterney, a butcher at Peckham, was brought to me on the 10th January, 1810; it had a very large spina bifida at the basis of the sacrum.

I opened it on the 15th by the same means as I have before described, and discharged about an ounce of limpid fluid.

On the [illegible]th I again opened it, and removed about an ounce of fluid, which was a little bloody; the child had been restless and had green stools, which is always a marked sign of irritation in children.

On the 19th the child had two convulsions; the tumor was opened; the fluid was a little sanious, and the tumor contained some solid matter; the child was much purged, and this was directed not to be repressed.

Two ounces of fluid were discharged on the 24th, and on the 26th an ounce and an half of fluid was drawn off, and a dossil of lint was applied upon the opening from the spinal canal into the tumor; this was firmly bound down by a roller.

On the 30th of January, 1st of February, 4th, 11th, and 26th, the tumor was opened.

Two ounces of fluid were also discharged on the 27th, and then a piece of sheet lead was placed upon the tumor, lined with lint and covered by a roller.

On February 28th, and on March 1st and 2d, it was opened.

On the 3d, plaster of Paris was applied upon the swelling after discharging its fluid; this was confined by a roller tightly applied.

On the 4th it had convulsive twitchings of its hands, quickened respiration; it was restless, hot, and cried much; half an ounce of fluid was discharged.

5th.—Vomited frequently; the swelling was again opened.

6th.—The fluid was discharged; lint and adhesive plaster were afterwards applied, and this plan was repeated on the 8th and 9th.

10th.—The tumor was not opened, because it felt so hard as to induce me to believe it had adhered.

11th.—Stools green; vomited frequently; bandage still applied, but not the adhesive plaster.

13th.—Child sick; stools green.

14th.—Two ounces of fluid discharged; plaster and roller applied.

17th.—Plaster of Paris applied wrapped in lint, and bound very tight.

19th.—Comatose, and convulsed, as it was thought, from the pressure of the bandage and plaster of Paris; these were removed, and a lighter bandage applied.

22d.—The child, which on the 19th appeared to be dying, is better to-day.

24th.—Is more lively; it sucks but little, the tumor being very large and full; a truss was applied.

27th.—The truss is to be continued, as the tumor is smaller.

30th.—Tumor reduced; the child has cut a tooth; the truss continued.

April 4th.—Appeared to be suffering pain and sickness from the truss, and it was removed.

9th.—Tumor pricked, and the truss re-applied.

14th.—The tumor again pricked.

18th.—Continues to wear the truss; the tumor was opened to-day; a handkerchief was doubled under the truss; the child vomited after its application.

22d.—Appeared in good health; the tumor was pricked, and again on the 26th, when there was some coagulable lymph in the fluid.

May 2d.—The swelling was pricked; also again on the 6th, and the quantity of fluid which was discharged was not diminished, continuing to amount to from two to three ounces.

The child was now sent to Messrs. Sharpe and Arnauld, Surgeons at Peckham, who attended the family, and who pricked the swelling at different times, and discharged the same fluid both in quantity and quality which I have described.

The adhesive process was, however, unequal to close so large an aperture as existed from the spine in this case, and I therefore abandoned the adhesive plan, and directed that the same mode of treatment should be pursued as in Applebee's case; that a truss should be applied, and constantly worn upon the part, and that the palliative rather than the radical cure should be attempted.

The tumor has been gradually diminishing under this mode of treatment; the child has grown in proportion to other children, and at the age of a year and a half is a very healthy boy.

These, then, are the two modes of treatment which I have pursued for the relief of those who are afflicted with spina bifida: the one palliative only; the other radical.

The first consists in treating the case as a hernia, and applying a truss to prevent its descent; and the second in producing adhesion of the sides of the sac, so as to close the opening from the spine, and stop the disease altogether. The first is attended with no risk. The truss forms an artificial vertebra when the natural is defective, a buttress which supports the part, and prevents the increase of the disease; but in this mode of treatment the truss is required in future life, for if discontinued the tumor re-appears, and will grow, as hernia does, to great magnitude, but with more fatal consequences.

On the contrary, the adhesive mode of cure exposes the patient to much constitutional irritation, but leaves him without the apprehension of the future return of the disease. And a finer and more healthy child cannot be seen than that which was cured by this mode of treatment.

It may be also observed that this mode does not prevent the subsequent attempt at the palliative treatment, if the radical should not be successful.

But as there are many cases of spina bifida which cannot be cured, it is right that I should state what are those which will not admit of relief.

If the tumor is connected with an unnatural enlargement of the head, hydrocephalus internus is conjoined with spina bifida; and the water will accumulate in the ventricles, if the tumor in the loins is attempted either to be palliated or radically cured.

If the lower extremities are paralytic, or the fæces and urine are discharged involuntarily, there is no hope of relief.

If the tumor has burst at the time of birth, or bursts soon after, there is little hope of cure; for although the opening in the skin may be closed by lint and adhesive plaster, and union be produced so as to admit of no further discharge of water, yet hydrocephalus internus will still succeed. In a case which I saw with Mr. Young, Surgeon, at Lambeth, I closed the opening, and applied a truss, but the head enlarged, and the child died after eight months with Hydrocephalus Internus.

The deficiency of the spine is sometimes so great as to lead to the production of a most extended tumor at the time of birth, and when this is the case the nerves are so far protruded from the spinal canal as to injure the structure of the spinal marrow, and to render every attempt at cure unavailing.

I should feel myself deficient in that liberality with which our profession ought ever to be marked, and usurping more than my due, if I did not state that the principle of the radical cure as proposed for Spina Bifida, is similar to that recommended by Mr. Abernethy in his work on Psoas Abscess.

The mode, however, which I have employed for the purpose is, I believe, the only safe [illegible] that of puncturing the part with a needle; for every opening of a larger size will be attended with the utmost danger.

I have for many years used this plan in cases of ganglia, when I could not burst them by a blow, or excite their removal by pressure or irritation; and I have never seen it followed by inflammation or any serious consequence; and it may be used in cases of accumulations in joints and other cavities where larger openings are dangerous.

Dr. Marcet was so kind as to analyse the fluid which was taken from the Spina Bifida of Little's child, and will probably soon favour the Society with the result of his observations on this fluid, compared with that of Hydrocephalus Internus.

[illegible]EMICAL ACCOUNT

OF

VARIOUS DROPSICAL FLUIDS;

WITH

REMARKS ON THE NATURE OF THE ALKALINE MATTER CONTAINED IN THESE FLUIDS, AND ON THE SERUM OF THE BLOOD.

By ALEXANDER MARCET, M.D. F.R.S.

ONE OF THE PHYSICIANS TO GUY'S HOSPITAL.

Read June 18, 1811.

THE attention of the Society having been lately directed by an interesting communication of Mr. Astley Cooper, to the singular species of dropsy called *Spina Bifida;* and various opportunities having been afforded me by that able and indefatigable inquirer, of examining the fluid which the spinal canal secretes in this disease, I made an analysis of that fluid, with a view to submit it to the Society.

It occurred to me in the course of this inquiry, that although there existed some detached accounts of most of the other species of dropsical fluids, yet a careful re-examination of these by the same individual, and by similar methods, would not be without interest. With [illegible] view, after analysing the fluid of Spina Bifida, I examined in succession those of hydrocephalus, and of dropsy of the pericardium, chest, and abdomen*. I afterwards inquired into some facts, respecting the blood itself, which seemed to require revision, and to which my attention had been naturally directed by the preceding researches.

This inquiry has thus become more extensive than was at first intended, and from the accidental circumstance from which it originated, the order of the subject has been in a manner inverted, since the serum of the blood was amongst the last fluids examined, though it is the obvious source from which all animal fluids are derived.

This, however, is of no material consequence, and I have thought it preferable, both for the sake of stating the facts exactly as they occurred, and also for my own convenience, to preserve in my narrative the same order which prevailed in the series of experiments.

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* The examination of the fluid of hydrocele, of hydatids, and that from a tumor of the thyroid gland, was afterwards added to this inquiry.

§ I. *Of the Fluid of* SPINA BIFIDA.

A. *General properties of the fluid.*—In several specimens of this fluid which I examined at different periods, [illegible] following properties were observed:

1. Its specific gravity was 1007*, water being 1000.

2. It was perfectly pellucid and free from smell, when quite recent; and it continued so for some days after it had been collected.

3. It was alkaline, as appeared from its imparting a green colour to paper stained with violets.

4. Muriatic acid produced no appearance of coagulation on being added to it. Sulphuric acid occasioned a slight turbidness, particularly when heat was applied. Nitric acid produced a white cloud, which immediately subsided, but disappeared by agitation.

5. Oxymuriat of mercury produced no effect at first, but on applying heat, a slight opacity was perceived.

6. Infusion of galls produced a slight turbidness, but no distinct precipitation.

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* In one instance it was found as low as 1006,6.

7. Alcohol occasioned no change whatever.

8. Oxalat of lime produced but a very slight cloudiness.

9. Both acetat of lead and nitra[illegible]silver formed abundant precipitates.

10. Muriat of barytes produced no pe[illegible]le effect on the fluid in its unconcentrated sta[illegible]

11. Solutions of oxymuriat of platina did not occasion any precipitate.

12. On applying a boiling heat to the fluid, neither coagulation, nor any precipitation took place. But on concentrating it by evaporation, a white greasy pellicle appeared, which became at last quite dry and brittle, emitting during the process a faint animal smell, not unlike that of saliva when heated in a similar manner. On pushing the heat still farther, there remained a half charred, spungy, brown, animal substance, covering or mixed with a saline mass confusedly crystallized.

13. Water being poured upon this mass, the greater part of the animal matter remained undissolved. Yet a portion of it was dissolved, together with the saline matter, as was obvious from the brownish colour of the filtered clear fluid, and the pellicle which re-appeared on a second or even third repetition of this process.

B. *Nature and proportion of the animal matter.*—Upon considering the results just related, especially those marked 4, 5, 6, and 13, and comparing them with the observations published at different periods by Dr. Bostock and other chemists*, respecting the detection and discrimination of the animal fluids, it will appear that the animal matter contained in this fluid consists almost entirely of a soluble uncoagulable substance, which may be called *extractive* or *muco-extractive matter*, with a mere vestige of albumen, and without any sensible quantity of gelatine. The slight cloudiness produced by the infusion of galls in Exp. 6. cannot, I think, be considered as indicative of the presence of jelly; on the contrary, from the dense precipitate which tannin forms with the smallest quantities of gelatine, and the turbidness which it is known to occasion in solutions containing albumen, there seems to be every reason to ascribe the effect in question to the small quantity of albumen known to exist in the fluid.

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* See in particular Dr. Bostock's essays, in Nicholson's Journal, vol. xi. page 244, and vol. xiv. page 140; and in the Medico-Chirurgical Transactions, vol. i. page 147.—See also Mr. Brande's paper in the Philos. Transact. for 1809, page 373; and Dr. Pearson's papers on expectorated matter and pus, in the Philos. Transact. for 1809 and 1810.

Dr. Bostock, in the second of the essays just quoted, gave a summary account of his examination of the fluid of Spina Bifida, which, in a great degree, will be found to correspond with this. But the differences which may be observed are in a great measure accounted for, by our improved knowledge of the mode of conducting these researches, an improvement to which Dr. Bostock has himself largely contributed.

As to the *proportion* of the animal matter, I tried to ascertain it by the following method:

1. 600 grs. of the fluid having been evaporated to dryness in a platina crucible, the residue, when brought by a sand heat to the spungy, bright, half-charred state before described, weighed 6,5 grs.

2. The mass being then made red hot, so as to burn entirely the animal matter (which was thus reduced to a few particles of ash or charcoal), its weight was diminished to 5,2 grs. from which I inferred that the weight of the animal matter contained in 600 grs. of the fluid, and desiccated in the mode I have just described, amounted to only 1,3 grs.* which is equivalent to 2,2 grs. in 1000 of the fluid.

C. *Quantity of the saline matter.*—After having burnt off the animal matter in the way just related†,

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* A small allowance should, in strict accuracy, be made for the coaly matter, the quantity of which, however, would have been scarcely ponderable.

† It may be objected to the method of incineration, which has been used for the separation of the salts from the animal matter in all these analyses, that the ammoniacal salts (if any be present in these fluids) would be driven off by that process. But as the co-existence of ammoniacal salts with a fixed alkali in excess is highly improbable, and as the fluids in question give out no

ammonia

the quantity of the remaining saline mass, in three successive experiments, made with different specimens of the fluid, was found to be as follows:

Exp.	1.	40[illegible],	of the fluid yielded	3,5 grs.
	2.	200	- - - -	1,7
	3.	300	- - - -	2,9

[illegible] that 900 grs. of the fluid yielded 8,1 grs. of saline matter.

The average quantity of saline matter, therefore, when dried at an incipient red heat, appears to be 9 grs.* in 1000 of the fluid.

D. *Nature and proportions of the saline ingredients.*—This part of the subject was investigated in the following manner:

1. Water being added to 5 grs. of the saline mass, the whole was readily dissolved, with the exception of a few white light flakes, which remained floating in the fluid, and appeared to be vestiges of animal matter. This solution, on being

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ammonia on adding to them caustic potash, there is every reason to suppose that the ammonia which is, under certain circumstances, yielded by these fluids, exists in them in a state of intimate union with the animal matter, or is actually formed in consequence of the processes of decomposition to which all kinds of animal matter are liable.

* With the addition of the minute quantity of insoluble salts mixed with the coaly matter.

filtered and slowly evaporated to dryness, was resolved into clusters of cubic crystals of muriat of soda, surrounded by a scanty pellicle of saline matter not crystallized, and evidently deliquescent.

2. This saline mass effervesced with acids, and being re-dissolved in water, had the following properties:

a. It changed to a green colour paper stained with violets.

b. It formed copious precipitates with nitrat of silver, and distinct, though inconsiderable ones, with nitrat and muriat of barytes; independently of the uncombined alkali, which had been previously saturated by acetic acid.

c. Oxalat of ammonia, prussiat of potash, caustic alkalis, and oxymuriat of platina, produced no precipitates whatever.

This solution, therefore, appeared to consist of muriat of soda, carbonat of soda, and a vestige of an alkaline sulphat.

3. The insoluble ash, or carbonaceous matter, which amounted but to a small fraction of a grain, being dissolved in a drop of diluted muriatic acid, was found to contain distinct traces of lime and

iron, but no vestige of sulphuric acid. Phosphoric acid was also discovered in this solution (after the separation of the lime) by solutions of supercarbonat of ammonia, and of any magnesian salt.

4. In order to ascertain the *proportions* of the two principal ingredients of the fluid (muriat of soda, and soda), I had recourse to the following

To a known quantity of the dry saline mass acetic acid was added, with a view to combine with the soda, and to form an acetat which is soluble in alcohol. The mass being then again dried, and afterwards treated with alcohol, in order to dissolve the acetat of soda, and thus separate it from the muriat; and the alcoholic solution being decanted off and evaporated to dryness, a residue, supposed to consist of acetat of soda, was obtained, which weighed between 17 and 18 *per cent.* of the mass *.

5. The next method which was tried consisted in precipitating the muriatic acid from a known

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* This process having been performed upon very small quantities of saline matter, and no opportunity of repeating it having occurred, I relate these particulars rather with a view to state the method I used, than from any great confidence in the accuracy of the result. Another process apparently susceptible of much greater accuracy was employed in the analysis of serum, as will be seen hereafter.

weight of the saline mass (previously acidulated by nitric acid), by nitrat of silver, and inferring from this precipitate the quantity of muriat of soda contained in the mass *. From this mode of operating it appeared that 100 gr[illegible] the saline mass contained 85 grs. of muriat of soda, the remaining 15 parts consisting almost entirely of soda, brought to the state of carbonat or subcarbonat, as may be inferred from the effervescence with acids before noticed †.

This last result, which implies rather a larger quantity of soda from the former process (which yielded only between 17 and 18 parts of acetat of soda), I am inclined to consider as the most accurate, because it was obtained by a more simple and direct operation.

E. *Recapitulation.* Upon the whole it may be inferred from what precedes, that 1000 grs. of the fluid of spina bifida consist of

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* It has been ascertained by accurate experiments that 100 grs. of ignited muriat of soda yield 241 grs. of ignited muriat of silver. See Dr. Henry's paper in the Philos. Transact. for 1810.

† I do not mean to assert, contrary to the opinion generally received, that the soda contained in the animal fluids does not exist there in a caustic state. But it is obvious that it must have been more or less carbonated during the process of combustion which the animal matter had undergone; and as a proof that the alkali originally exists in the caustic state, or in a peculiar state of combination with the animal matter, it may be observed, that if an acid be poured upon the dry residue, before the animal matter has been burnt off, no effervescence is observed.

Water - - - -	988,60 grs.
Muco-extractive animal matter, with a vestige of albumen, brought to the state of a dry brownish spungy mass just beginning to be charred * -	2,20
Muriat of soda † heated to incipient ignition - - - -	7,65
Soda, brought to the state of sub-carbonat and heated to incipient ignition, with a vestige of an alkaline sulphat - - -	1,35
Phosphat of lime, and phosphat of iron, a quantity not exceeding -	0,20
	1000,00 grs.

which makes a total of 11,4 grs. of solid matter, heated in the manner just stated, in 1000 grs. of the fluid, 2,2 grs. of which consist of animal matter, and 9,2 grs. of saline ingredients.

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* This standard of desiccation may appear somewhat indefinite. But it is extremely difficult to obtain perfect uniformity in analytical processes in which animal substances are concerned; and I believe that, upon the whole, this mode of estimation will be found to yield more uniform results than those commonly employed.

† I considered this salt, at the time this analysis was made, as the only muriat present. But from subsequent analyses of other animal fluids, I now think it probable, that in all of them, a minute portion of muriat of potash is to be found mixed with the muriat of soda, a circumstance which will be hereafter explained at full length.

§ II. *Of the Fluid of* HYDROCEPHALUS INTERNUS.

The experiments above related on the fluid of spina bifida were made about 18 months ago. An opportunity having occurred in the course of last autumn, of examining the fluid which is effused in the ventricles of the brain in hydrocephalus, the result shewed, as might have been anticipated, that a close resemblance, if not a perfect identity, obtained between this fluid and that of spina bifida.

As the series of experiments in this analysis was conducted in the same manner as in the former, I shall not trouble the Society with unnecessary chemical details, and shall confine myself to a general statement of results.

The specific gravity of this fluid was 1006,7; and the general effects of re-agents, the pellucidity of the fluid, and all its other obvious properties, corresponded exactly with those of the fluid of spina bifida.

Two different specimens of fluid of hydrocephalus, evaporated and dried as in the former analysis, exhibited similar results, but yielded a mean proportion of solid ingredients somewhat smaller than that obtained from the fluid of spina bifida.

The only new circumstance which occurred during this analysis, was the detection in one of the specimens examined, of a distinct trace of magnesia[*], mixed with the coaly mass not soluble in water after the incineration of the residue; an appearance which might probably have also been remarked in the fluid of spina bifida, had this coaly residue been examined with the same degree of minuteness[†].

Upon the whole, the solid contents of 1000 grs. of the fluid of hydrocephalus appear to consist of:

Water - - - -	990,80	grs.
Muco-extractive matter, with a vestige of albumen, desiccated as in the preceding analysis - -	1,12	
Muriat of soda[‡] - - -	6,64	
Subcarbonat of soda, with a vestige of an alkaline sulphat - - -	1,24	
Phosphat of lime, with traces of phosphats of magnesia and of iron -	20	
	1000,00	grs.

which makes a total of 9,2 grs. of solid matter, consisting of 1,12 gr. of animal matter, and 8,08 of saline ingredients, in 1000 grs. of the fluid.

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[*] I find that Dr. Pearson, in his examination of expectorated matter, has been led to suspect the existence of magnesia in that substance. See Philos. Transact for 1809. Part I. page 328.

[†] The whole of the saline contents of the coaly mass, when separated by muriatic acid, and evaporated to dryness in a sand heat, amounted to about 0,1 gr. in each 500 grs. of the fluid.

[‡] The note, page 350, respecting the probable existence of a small portion of muriat of potash, applies equally to the present analysis.

§ III. *Inquiry into the Nature of the* ALKALINE MATTER *contained in the Animal Fluids, exemplified in the Fluid of Hydrocephalus.*

I selected for this inquiry a few grains of saline matter, from a specimen of fluid of hydrocephalus internus which I had collected from the head of a boy who died of that disease under my care; the animal matter having been previously removed by incineration in the manner above described.

1. This saline matter being dissolved in a small quantity of distilled water, and exposed to spontaneous evaporation in a glass capsule, the weather being very warm, and the atmosphere particularly dry, it was found reduced, in the course of two or three days, to the state of a dry crystalline mass, which exhibited a number of large cubic crystals, some of which measured from 8th to 6th part of an inch, mixed with other crystals of the same form, but of much smaller dimensions. In the interstices between these crystals, and on the margin round them, there were observed small white opaque dots, or globules, interspersed with numerous needles, or spicular transparent crystals, perfectly distinct, though of a minute size.

2. The needles, or spicular crystals, were found to be carbonat of soda. The opaque globules proved also to be carbonat of soda. Most of the cubes

were muriat of soda, but some of the smaller ones were found to be *muriat of potash.*

3. From another specimen of the same fluid, procured from another dead subject, and treated in a similar manner, the same appearance of cubic crystals interspersed with white specks was obtained; but in this no transparent needles appeared. Here, as in the former specimen, a few small crystals of muriat of potash were found mixed with the muriat of soda, and the white specks, as in the former instance, consisted exclusively of carbonat of soda.

This specimen appeared to contain less muriat of potash than the former, and in both of them the muriat of soda seemed greatly to prevail.

4. The chemical tests which were used for the discovery of potash, and by which this alkali was discriminated from soda, were solutions of tartaric acid, and of oxymuriat of platina*, two re-agents which have the property of forming with potash, in whatever state of combination, salts possessed of but little solubility; so that, if potash be present, a precipitate falls down, and white lines appear on

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* Both these tests, provided the solutions be not too dilute, are very distinct in their indications; but I believe that the tartaric acid is capable of discovering more minute quantities of potash than oxymuriat of platina. It is necessary, in the preparation of the latter test, to expel any excess of acid by previous evaporation to dryness.

scratching the vessel with a pointed instrument*.

5. The carbonat of soda was identified, not only by tests indicative of the absence of potash, but also by its forming rhomboidal, instead of prismatic crystals, when treated with nitric acid†.

6. It may be worth while mentioning, that none of the cubic crystals, when well washed, were found to contain both soda and potash; and that it appeared by comparative trials, that, when mixed solutions of muriat of soda and muriat of potash were caused to crystallize, the cubic crystals obtained consisted either of pure muriat of potash, or pure muriat of soda; the two muriats never being found mixed in the same cube. In some of my first trials, both upon the fluid of spina bifida, and upon that of hydrocephalus, I had been led to conclude that no potash was present, from having

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* While correcting this sheet, I learn from my friend Mr. Charles Aikin that the tartaric acid produces, with strong solutions of soda, or of carbonat of soda, precipitates resembling in appearance those obtained from potash or its compounds. But there is this material difference between the two alkalies, that soda forms a supertartrat which is comparatively very soluble; and that the compounds which soda forms with the nitric, muriatic, and acetic acids, are not visibly acted upon by the tartaric acid, whilst all the salts of potash are decomposed by that acid.

† Nitrat of soda crystallizes in rhombs, whilst nitrat of potash usually appears in the form of hexagonal prisms.

obtained no precipitates by oxymuriat of platina; but this had no doubt arisen from my having operated upon dilute solutions of the entire saline mass, instead of selecting particular crystals*.

7. It was in consequence of Dr. Pearson's assertions (both in conversation and in his valuable papers on expectorated matter), that the uncombined alkali contained in the serum of blood was potash and not soda, contrary to the opinion generally received, that I was induced to direct my attention to the subject. The statement of Dr. Pearson, that tartaric acid, when added to the saline matter of serum, produces supertartrat of potash, and that therefore potash must be present, was fully confirmed by the experiments just related, in regard to the fluid of hydrocephalus; and the same coinci-

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* I cannot refrain from taking this opportunity of acknowledging the great advantages which I have derived from the writings of one of our honorary members, Dr. Wollaston, from his conversation, and occasionally also from his kind personal assistance in this and other similar inquiries. The acuteness with which he discriminates crystalline forms, however minute, the neatness of his chemical manipulations, and the dexterity with which he analyses the smallest quantities of matter, are known only to those who have seen him engaged in experimental researches. The chemistry of microscopic quantities is in a great degree his own. The large, dismal, subterraneous laboratory of old chemists, is now changed for the fire-side of a comfortable study; and a new school is rising under his auspices, and those of two or three other British chemists, which promises to give a most essential impulse to the progress of analytical chemistry.

dence of results was obtained, as I shall soon notice in detail, when the serum itself was examined. But there is this material difference between Dr. Pearson's conclusions and those which I have drawn from my experiments, that Dr. Pearson has considered the uncombined alkali as consisting exclusively of potash*, whilst I believe it to consist exclusively of soda, and consider the small portion of potash present as being combined with muriatic acid.

§ IV. *Of the Fluids of* ASCITES, HYDROTHORAX, *and* HYDROPS PERICARDII.

Whilst I was engaged in the experiment just related, I was favoured by Dr. Okes, of Caius College, Cambridge, with specimens of dropsical fluids from the cavities of the abdomen, of the thorax, and of the pericardium, all of them from the same subject†. Dr. Okes, who is now attending the medical practice of Guy's Hospital, procured these various fluids from the body of a young man of 17, who had recently died in the Hospital of an universal dropsy.

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* Since the first edition of this volume, Dr. Pearson has published in vindication of this opinion, several papers in Nicholson's Journal, and in the Philosophical Magazine; and I have endeavoured to answer his arguments in the same periodical works, partly by new facts, and partly by theoretical reasoning. Professor Berzelius, who has since published a paper on animal fluids, in the third volume of these Transactions, states the alkali to be soda, partly uncombined, and partly united with the lactic acid; and that eminent chemist does not even appear to consider the subject as admitting of doubt or discussion.

† I have also, in the course of this inquiry, been obligingly assisted in procuring specimens of fluids, by Mr. Lewis, assistant to Mr. Cooper, and by Messrs. Johnson and Calloway, both pupils to Guy's Hospital.

These fluids, when first examined, were quite recent and free from smell. They differed much in regard to the quantity of animal matter from either of the preceding fluids; but they bore a close resemblance to each other, both in their external and in their chemical properties, though small differences were observed, as will appear from the following particulars.

A. *Fluid from the cavity of the Abdomen.*

1. It was of a yellowish colour, inclining to green.

2. Its specific gravity was 1015.

3. It was alkaline.

4. The mineral acids threw down from it considerable white flaky precipitates.

5. On applying heat, considerable masses of coagulated albumen appeared, though not in sufficient quantities to convert the whole fluid into an uniform solid coagulum.

6. 600 grs. of this fluid being evaporated to dry-

ness, the residue, when reduced to the half charred state before described, weighed 20,2 grs.

7. In order to acquire more precise information respecting the nature of the animal matter contained in this fluid, a portion of it, equal to about 900 grs. was boiled with a little dilute muriatic acid. After the separation of the albumen coagulated by this process, the clear fluid gave no ponderable precipitate with either oxymuriat of mercury, or infusion of galls, though with both it occasioned a slight cloudiness. This clear fluid being evaporated to dryness, yielded 5,1 grs. of salt*, and 2,3 grs. of half charred animal matter (apparently of the muco-extractive kind), independently of the albumen which had been previously separated. During this evaporation a smell arose very much resembling that of urea; but it should be observed that the fluid under experiment had begun to putrefy.

8. The residual mass (6), after being ignited in a platina crucible, and after being separated from the coaly matter by re-dissolution, filtration and re-evaporation to dryness in a sand heat, was reduced to 4,8 grs.

9. This saline mass, when caused to crystallize

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* The salts were separated from the animal matter, as usual, by incineration.

slowly, exhibited clusters of crystals, partly cubic, partly octohedral, interspersed with others of a feathery or radiating appearance.

10. The feathery saline matter effervesced briskly with acids, and yielded no permanent precipitate either with tartaric acid or with oxymuriat of platina.

11. The cubic and octohedral crystals, on the contrary, yielded a precipitate with either of the two tests just mentioned.

12. Solutions of barytes appeared to indicate rather a greater portion of sulphuric acid in this than in the former fluids.

13. A portion of the saline mass being treated with dilute nitric acid, and the solution being gently evaporated, a confused crystallization took place, in which rhomboidal crystals were distinctly discoverable.

14. The coaly matter (8) being treated with dilute muriatic acid, and the filtered solution evaporated to dryness in a sand heat, the saline residue thus obtained weighed 0,3 grs.

15. This residue was found to contain lime, iron, magnesia, phosphoric acid, and a minute quantity of animal matter.

16. It appears from all these particulars that 1000 grs. of the fluid of ascites* consist of

Water	966,5 grs.
Albumen, desiccated as in the preceding analyses	22,6
Muco-extractive animal matter	2,5
Muriat of soda, with a little muriat of potash	6
Subcarbonat of soda, with some traces of an alkaline sulphat†	1,9
Phosphats of lime, iron, and magnesia	0,5
	1000,0 grs.

which makes a total of 33,5 grs. of solid matter in 1000 grs. of the fluid, of which 25,1 grs. consist of animal matter, and 8,4 of saline ingredients.

B. *Fluid from the Thorax.*

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[*] The fluid in question was, as I stated before, taken from the cavity of the abdomen. Since the first edition of this volume, I have had the opportunity of examining the fluid of an ovarian dropsy obtained by paracenthesis. It was somewhat viscid, and of a chocolate brown colour. Its specific gravity was 1020,2. It deposited, on standing, a considerable quantity of brown sediment. By heat or acids it was reduced to the state of a thick pulp, but not to that of a firm mass. It contained exactly eight grains of salts in 1000 grs. of the fluid.

[†] The specimen of fluid used to determine these proportions was from the thorax, as the supply of abdominal fluid happened to be exhausted; but these two fluids resembled one another so closely in their general properties, that there is no reason to suppose they would have been found to differ in regard to the proportion of alkali.

1. The external appearance of this fluid was nearly the same as that of the former; but on pouring it from one vessel into another, after it had stood for 24 hours, a portion of it appeared heavier than the rest, having somewhat of a pinkish hue, and forming a distinct mass like the white of an egg. By agitation, however, this denser portion appeared to diffuse itself throughout the fluid, and on the fluid being again left at rest for some hours, there subsided a few flakes of a self-coagulable substance, which all albuminous fluids are apt to deposit.

2. The specific gravity of that fluid was 1012,1.

3. On being evaporated and desiccated in the same way as the former, it yielded only 26,6 grs. of solid matter in 1000 of the fluid; 18,8 grs. of which consisted of animal matter, and 7,8 grs. of saline ingredients, namely, 6 grs. of muriats, and 1,8 grs. of carbonated alkali.

In all other respects, so far as it was examined, this fluid appeared perfectly similar to the former.

C. *Fluid from the Pericardium.*

1. Its specific gravity was 1014,3.

2. It yielded 33 grs. of solid matter in 1000 of the fluid; namely, 25,5 grs. of animal matter, and 7,5 grs. of salts.

In its external appearance, and in every other respect, no difference was observed between this and the two preceding fluids.

§ V. *Of the* SERUM *of the Blood.*

The serum of blood has so often been the subject of chemical examination, that I should have thought it superfluous to have turned my attention to it, had I not been desirous of obtaining, respecting this fundamental fluid, some general results more immediately comparable with those which I have just related respecting the morbid serous secretions. We are indebted to Dr. Bostock for an accurate examination of the animal matter contained in the blood, and for the curious discovery of the absence of gelatine in the serum*, which my own trials have fully confirmed. I shall therefore chiefly direct my attention to the *saline contents* of the serum, such as obtained by incineration; previous to which, however, I shall shortly relate my attempts to ascertain the specific gravity of serum, and the proportions of albumen and extractive matter which it contains.

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* See Medico-Chirurgical Transact. vol. I. and II. If any coincidence should be observed in my researches on serum, with those of Dr. Bostock, published in this volume of the Society's Transactions; or if either of the two essays should appear to have derived any assistance from the other, I think it right to mention that I have had, through the kindness of Dr. Bostock, and from my situation as one of the secretaries, the advantage of a free access to Dr. Bostock's manuscript, whilst I was finishing my own paper; so that I am alone responsible for any repetition or redundance which may have occurred in the course of our inquiries.

A. I found the *specific gravity of serum* to be subject to remarkable variations. The first specimen which I examined was procured from a healthy person who had been bled for a slight local injury. Its specific gravity was 1024,5. The next specimen was obtained from a stout young woman labouring under acute rheumatism, attended with pulmonic affection. This blood was not buffy, though the symptoms were indicative of inflammation; the specific gravity of the serum was 1032,5. A third specimen was obtained from the same patient two days afterwards: the blood had this time a thick buffy coat on its surface, and the specific gravity of the serum was 1029,8. A fourth specimen procured from a patient labouring under a febrile affection was exactly of the same specific gravity as the last, namely, 1029,8; this blood had but a very slight buffy coat, and the serum was somewhat turbid, like whey. In a fifth specimen of serum, from a mass of blood which did not exhibit the smallest degree of inflammation, the specific gravity proved to be 1030,9.

The mean specific gravity of serum, therefore, resulting from these five observations would be 1029,5, the two extreme points being 1024,5 and 1032,5.

B. *Proportions of coagulable and uncoagulable animal matter in Serum.* I attempted to ascertain these proportions in the following manner:

1. 500 grs. of recent serum of the specific gravity of 1029,8 being exposed to the heat of a lamp, soon passed to the state of a white coagulated mass, apparently firmer and containing a smaller proportion of uncoagulable serosity than any of the preceding fluids. This coagulum being gradually desiccated, and ultimately brought to the half charred state often described, weighed 50 grs.

2. 500 grs. of serum, from the same specimen, were boiled with a few drops of muriatic acid, so as to coagulate the albumen completely; water was then added to the coagulated mass in order to wash off the whole of the serosity. This was effected, not by filtering, for the liquor passed through the filter milky, but by slow spontaneous separation, and decantation. The clear fluid was no longer acted upon by oxymuriat of mercury, and in evaporating gave no smell of urea. The residue, when brought to the state of a half charred brittle mass, weighed 3,6 grs. from which 1,6 grs. of salt were afterwards obtained by incineration. The proportion of muco-extractive matter, therefore, thus desiccated, would only be 2 grs., and that of albumen about 44 grs. in 500 grs. of serum.

C. *Saline contents of the Serum of the Blood.*

1. 1000 grs. of recent serum, of the specific gravity of 1024,5, being incinerated in the usual

mode, the soluble salts, separated by water, and desiccated to incipient ignition, weighed 7,7 grs. This saline matter was alkaline, and amongst the confused crystalline forms which it exhibited, distinct octohedral crystals were observed, though no smell of urea had been observed during the evaporation. This mass soon deliquesced on being exposed to the air.

2. The coaly mass being treated with dilute muriatic acid, and the clear acid solution evaporated to dryness in a sand heat*, the saline residue weighed 1,5 grs., which, with the 7,7 grs. obtained by the first operation, makes 9,2 grs. of salts in 1000 grs. of serum†.

3. About two-thirds of this last residue appeared to consist of cubic crystals of muriat of soda, which had remained attached to the insoluble salts after incineration, and had escaped the action of the

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* By a *sand heat* I have meant, throughout this paper, the greatest heat which can be communicated to a small saucer containing a little sand, by a lamp of moderate power. the degree of dryness thus obtained is tolerably uniform, and very nearly equals, in the case of fixed salts, that which is obtained by heating the naked vessel to incipient redness.

† In one instance in which the specific gravity of the serum was 1032,5, the whole quantity of saline matter was only 6 grs., so that if any conjecture may be hazarded upon a single result of this kind, the natural inference would be that the denser serum is, the less saline matter it contains.

watery solvent. The remaining third proved to consist of iron, lime and magnesia, combined with phosphoric acid. All these substances were distinctly detected by their respective agents. The presence of magnesia, in particular, was discovered in this mass, by dissolving a portion of it in muriatic acid, precipitating the lime by oxalat of ammonia, and adding to the filtered solution, neutral carbonat of ammonia. On scratching the vessel, the appearance of white lines, which characterizes the formation of an ammoniaco-magnesian phosphat, was distinctly perceived.

4. The saline mass soluble in water (1), consisted chiefly, as in all the preceding fluids, of muriat of soda, with some uncombined alkali. It also contained a distinct trace of the sulphuric and phosphoric acids, which shewed the presence of minute portions of an alkaline sulphat and phosphat. Neither lime nor iron could be detected in this mass.

D. *Nature and proportion of the Alkali contained in Serum.* The next, and indeed the principal objects which I had in view in examining the serum, were to ascertain the nature of the uncombined alkali contained in it, and the proportion of this alkali.

1. From a concentrated solution of the saline mass (C. 4.), oxymuriat of platina did not produce a precipitate sufficiently distinct to be conclusive.

as to the presence of potash; but by means of tartaric acid, a distinct, though not abundant, precipitate was produced.

2. A portion of this saline mass being dissolved in nitric acid, and the solution evaporated to dryness, a deliquescent crystalline mixture was obtained, in which the rhomboidal form was conspicuous.

3. Another portion of the same mass being dissolved in acetic acid, evaporated to dryness, and afterwards treated with alcohol and evaporated again, the alcoholic residue, contrary to my expectation, exhibited traces of potash, both by means of the tartaric acid and of oxymuriat of platina *. But the same residue treated with nitric acid was almost entirely resolved into rhomboidal crystals, amongst which I was unable to detect any distinct prisms; whilst on the contrary, potash was easily discovered in the residue insoluble in alcohol, which residue had now lost its deliquescent quality.

4. It appears, therefore, that the uncombined alkali contained in the serum, is (as in the case of

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* This result may appear scarcely compatible with that which follows; but I have reason to suspect, from some comparative trials, that this appearance of potash in the alcoholic solution was owing to a few particles of muriat of potash taken up by the spirituous menstruum.

all the other fluids), *soda* and *not potash*, and that the small portion of potash contained in the serum of blood exists there in the state of muriat *.

5. The proportion of the uncombined soda contained in serum was ascertained by a method which appears to admit of great accuracy. To 10 grs. of ignited saline matter from serum of blood, a known bulk of very dilute muriatic was added, which was more than sufficient to neutralize the solution, and a piece of marble of known weight was thrown into this solution to neutralize the redundant acid. On the other hand, a similar measure of acid being poured upon another piece of marble, and the diminution of weight of both pieces of marble compared, that which had been treated with muriatic acid alone was found to have lost 1,9 grs. more than the other; and as 1,9 grs. of carbonat of lime correspond to 1,05 grs. of ignited muriatic acid, and to 1,23 grs. of soda †, it was inferred that 10 grs of the saline mass in question contained 1,23 grs. of pure caustic soda, which is equivalent to about 1,8 grs. of the subcar-

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* Or perhaps also of sulphat, as will be discussed hereafter.

† The data upon which these statements are grounded, are detailed in my Analysis of the Dead Sea, in which it is shewn that 100 grs. of pure marble contain 56,1 grs. of lime; 100 grs. of muriat of lime contain 50,77 grs. of the earth, to 49,23 grs. of the acid; and 1000 grs. of muriat of soda contain 46 parts of acid, to 51 of alkali. (Philos. Transact. 1807.)

bonat *, a proportion which does not materially differ from those obtained by different methods in the analysis of the dropsical fluids.

E. *Nature and proportion of the Alkaline Sulphat contained in Serum* †.

1. 10 grs. of the ignited saline matter of serum being dissolved in water, and neutralized by muriatic acid, muriat of barytes precipitated from this solution 0,5 grs. of ignited sulphat of barytes.

2. It now became a question to decide whether the alkaline sulphat contained in the serum, as well as in all the other animal fluids, was a sulphat of potash or a sulphat of soda. The superior attraction of sulphuric acid for potash rendered the first of these suppositions most probable; and it was farther confirmed, by observing, that by mixing together solutions of muriat of potash and sulphat of soda, and evaporating the mixture, sulphat of potash was obtained in dodecahedral crystals.

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* Subcarbonat of soda consists, according to Mr. Kirwan, of 2 parts of acid to 3 of alkali. The present result, however, does not admit of an accurate comparison with those obtained in the analyses of the dropsical fluids; since by the method which was then employed, the soda was neither in a caustic state, nor in a state of definite combination.

† According to Professor Berzelius, sulphuric acid does not originally exist in the animal fluids, but is formed by the process of incineration.

3. In order to form an estimate of the quantity of sulphat of potash corresponding to this precipitate, 20 grs. of ignited sulphat of potash, prepared on purpose from pure ingredients, were dissolved in water, and decomposed by muriat of barytes.—The ignited precipitate weighed 26,4 grs.* Therefore, the quantity of sulphat of potash contained in 10 grs. of the saline matter of serum, appears to be about 0,4 grs.

F. *Recapitulation.* On reviewing and connecting together the foregoing statements on the subject of serum, we may conclude that 1000 grs. of this fluid consist of the following ingredients: *viz.*

Water - - - - -	900 grs.
Albumen, reduced by a sand heat to the state of a dry brittle mass, as in the former analyses - -	86,8
Muco-extractive matter dried in the same way - - - -	4,0
Muriat of soda, with a little muriat of potash - - - - - -	6,6
Subcarbonat of soda - - -	1,65
Sulphat of potash - - -	0,35
Phosphats of lime, iron, and magnesia	0,60
	1000,00 grs.

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* So that 100 grs. of sulphat of potash would give 132 grs. of ignited sulphat of barytes.

which makes a mass of 100 grs. of solid matter in 1000 of serum, 90,8 grs. of which consist of animal matter, and 9,2 grs. of saline ingredients.

§ VI. *Summary Account of some other Dropsical Fluids.*

A. *Fluid of Hydrocele.* A specimen of this fluid, with which I was favoured by Mr. Cooper, had the following properties:

1. It was perfectly clear and transparent, resembling in appearance pale sherry wine. Its specific gravity was 1024,3. It had no smell, and deposited no sediment whatever on standing for a few days. After a week, however, it became slightly turbid, and on removing the cork it exhaled a strong smell, resembling that of phosphorated hydrogen.

2. The dilute mineral acids produced only a slight turbidness; but in their concentrated state, they produced abundant white precipitates. Oxymuriate of mercury and alcohol threw down copious white precipitates. Infusion and tincture of galls both produced considerable brownish precipitates.

3. Heat and concentration occasioned first an opacity and then a thickening of the fluid mass, which, by stirring, assumed the form of a white semi-solid pulp, like thick paste; and by continu-

ing the heat, the mass passed to the state of a firm coagulum.

4. Some of the serosity, or uncoagulable part of the fluid, being separated, and farther concentrated, did not gelatinize on cooling; yet it still became turbid, though in a much slighter degree than the original fluid, on adding infusion of galls. This serosity being boiled with oxymuriate of mercury, according to Dr. Bostock's method, in order to separate the last portions of albumen upon which I suspected the effect of galls to depend, a milkiness appeared, which could not be entirely removed by filtering; but on adding infusion of galls to the filtered fluid, no further effect could be discovered.

5. 500 grs. of this fluid being evaporated to dryness, and incinerated in the usual way, yielded a saline mass, which, dried at a sand heat, weighed 4,1 grs.

6. 200 grs. of the same fluid being evaporated and reduced to the half charred state often described, weighed 16 grs., which makes a proportion of 80 grs. of saline matter in 1000 grs. of the fluid, 71,5 grs. of which consisted of animal matter, and 8,5 grs. of saline ingredients *.

B. *Fluid of a Hydatid.* A quantity of this fluid was procured from a hydatid attached to the kidney of a woman whose body was opened by Mr. Cooper and myself at Guy's Hospital. It was clear and transparent, though of a yellowish colour. No coagulum or turbidness appeared on adding dilute sulphuric or muriatic acid; but concentrated muriatic acid produced a milkiness. Infusion of galls and oxymuriate of mercury occasioned precipitates. Heat did not produce any coagulation, except after very considerable concentration. The specific gravity of this fluid was not ascertained; but 1000 grs. of it being evaporated to dryness at a temperature not exceeding 180°, the residue weighed 36 grs. *, and yielded by incineration a saline mass weighing 8,7 grs. This saline mass contained the usual ingredients, namely, muriat of soda crystallized chiefly in octohedrons, phosphat of iron and of lime, and a small portion of sulphuric acid.

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* Allowing 0,3 grs. for the saline matter contained in the coaly mass.

Upon the whole this fluid, which was examined long since, and with much less minuteness than the others, appears to resemble much in its chemical composition that of hydrocephalus and spina bifida, only containing a larger proportion of animal matter, which was chiefly of the muco-extractive kind, since it did not either

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* This residue having, by an accidental oversight, been desiccated at a lower temperature than the other fluids, the result is not immediately comparable to those obtained in the other anylyses.

coagulate by heat, or gelatinize by cold and concentration.

C. *Fluid from a Tumor in the Thyroid Gland.* The fluid in question was discharged after death, from a cyst formed in each lobe of the thyroid gland of a middle-aged woman who died at the hospital. The whole of the fluid contained in these tumors amounted to between 2 and 3 ounces. It was of a reddish brown colour, not unlike that of a decoction of bark, this colour being evidently not occasioned by any accidental admixture of blood. The fluid was unctuous to the touch, and innumerable small micaceous particles were seen floating in it *. Its specific gravity was 1031,8. Paper stained with violets indicated the presence of uncombined alkali. Heat converted it into a firm coagulum of a greyish white colour. It was also readily coagulated by acids and by oxymuriat of mercury, and yielded a copious precipitate on adding an infusion of galls. On adding caustic potash, the fluid continued clear, and no smell of ammonia arose from it. On separating the incoagulable serosity by ablution with water, and evaporating till nothing but a dry extract remained in the vessel, no gelatinization took place by cooling at any period of the operation, but there arose a strong offensive smell, resembling that of urea *.

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* A portion of this fluid having been allowed to stand till it was beginning to putrefy, a sediment was observed to subside from it. The supernatant liquor being decanted off, the sediment was spread upon a card, where it soon dried, leaving a glossy shining film upon the card. This substance being scraped off and exposed to the heat of a candle, burnt with a bright flame, and apparently without undergoing previous fusion. Another portion being treated with alcohol, appeared to dissolve partly in it, and reappeared on adding water, or evaporating the alcohol.

On heating the coagulum to redness, the mass swelled, bubbled up, and finally burnt as usual, emitting a smell resembling that of burning horn, and leaving a coaly residue.

The whole of the salts contained either in the serosity or in the albuminious part, being in the usual way separated by incineration, amounted only to 5 grs. in 1000 of the fluid, a smaller proportion than that yielded by any of the other fluids †. But in their nature, these salts appeared to be in every respect similar to those of the other fluids before described.

D. *Fluid from a Tumor in the Chest.* The circumstances attending this tumor were singular. A female patient in Guy's Hospital, under the care of Dr. Curry, was labouring under an oppression in her breathing, and other symptoms resembling those of Hydrothorax, though not in any urgent degree. Upon examination, a distinct and considerable protuberance was observed on the right side of the chest, in consequence of which the ribs themselves were thought to protrude. A puncture being made with a lancet in the pectoral muscles, where the tumor appeared the most prominent, about a pint of fluid, perfectly clear and colourless, was discharged, and the woman rapidly recovered.

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* The fluid was, at this time, beginning to putrefy.

† The separation of the salts was not, in this fluid, of which I had but a very scanty supply, conducted with the same accuracy as in the other fluids. For this reason I have not inserted this result in the table at the end of this paper.

The specific gravity of this fluid was 1008,5, and upon minute examination it was found to resemble closely in its properties the fluid of Hydatids or that of Hydrocephalus; and it differs so much from that of Hydrothorax in regard to the quantity of animal matter and the proportion of albumen, as well as to its external appearance, as to render it highly probable that the disease depended upon some peculiar encysted effusion on the surface, and not, as was suspected, within the cavity of the chest.

With respect to the saline contents, they amounted to 9 grs. in 1000 of the fluid, and appeared to be perfectly similar to those of the other fluids before examined.

§ VII. *General View of all the preceding Results.*

As there are but few readers to whom chemical details are interesting, and as most of them may be glad to obtain some general notions of the results, without wading through a mass of experimental evidence, it may be proper to retrace, in a few words, the leading points of this inquiry.

It appears in the first place, that the prevailing animal substance, not only in serum, but in all the morbid fluids which have been examined in this essay, is albumen, or coagulable matter; which substance, however, these fluids contain in very different proportions.

In all of them, also, another kind of animal substance which may be called muco-extractive matter, (from its being incoagulable, and from its being soluble in water or other menstrua,) is uniformly discoverable.

Gelatine, it would appear, is not discoverable in any of these fluids*; a singular circumstance, from which it seems natural to infer that the formation of gelatine is the result of a specific secretion.

In some of these fluids, namely, those of ascites, hydrothorax, hydrops pericardii, hydrocele, and that which is sometimes effused in the thyroid gland, the albuminous matter is so considerable as to render them coagulable; that is, convertible into an uniform semi-solid mass, by the agency of acids, or by a temperature of 165 degrees. In others, on the contrary, namely, in the fluid of spina bifida, of hydrocephalus, and of hydatids, the quantity of albuminous matter is so small, as scarcely to be rendered visible by heat or acids.

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* Since the publication of the first edition of this volume, I have also examined the fluid discharged by blistered surfaces, in which I have not been able to detect the least vestige of gelatine. The specific gravity of this fluid, and its proportion of saline matter, will be found in the table at the end of this paper.

The specific gravity of these fluids is likewise remarkably various. That of the fluid of hydrocephalus, for instance, is under 1007; whilst that of serum sometimes exceeds 1032. Different specimens of the same fluids are also found to vary in their specific gravities. This is especially conspicuous with regard to the serum of blood, some specimens of which do not exceed 1024, whilst others rise to 1032,5. Even in the same individual, and during the continuance of the same disorder, differences of specific gravity are observable in serum obtained at different periods. Thus, also, it is found that dropsical fluids from different cavities of the body, collected after death from the same individual, differ materially in regard to their specific gravities.

Upon farther examination it is found that these differences affect principally, and perhaps exclusively, the animal matter of these fluids; the saline matter contained in them not being subject to similar variations.

These saline contents, on the contrary, are found to be remarkably uniform in the different fluids, both as to their proportions and their chemical nature; and the same uniformity prevails whatever differences there may exist in these fluids in regard to the animal matter they contain. Thus, serum of blood, and the fluid of hydrocephalus, yield the same saline substances, and very nearly in similar proportions, although the one contains about eighty times as much animal matter as the other [*]. The proportion of saline matter yielded by the various animal fluids concerned in this inquiry, may be generally stated to be between 8 and 9 grs. in 1000 grs. of fluid.

The particular saline ingredients contained in all these fluids appear to be, muriat of soda, muriat of potash, sulphat of potash, soda, and phosphats of lime, iron and magnesia. And a mass of 100 gr[illegible] of these salts appears to consist of about 72 grs. of muriat of soda, mixed with a little muriat of potash; between 18 and 20 grs. of soda, brought to the state of subcarbonat; and a mixture of 8 or 10 grs. of sulphat of potash, phosphat of lime, phosphat of iron, and phosphat of magnesia. Potash, therefore, as Dr. Pearson has stated, is present in the animal fluids; but I believe I have satisfactorily shewn, that it exists in the state of muriat, or sulphat; soda being the only alkali discoverable in an uncombined state.

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[*] A table, exhibiting the general results of all the above analyses, will be found at the end of this paper.

The caustic alkali contained in these fluids appears to be combined with their animal matter, the properties of which it modifies in a manner which is not yet well understood*: and it would seem that the proportion of uncombined alkali to that of the other salts is greater, as the specific gravity of the fluid is more considerable.

These circumstances, and in particular the remarkable variations which are observed in the proportions of animal matter contained in the blood of different persons, or of the same person at different periods, derive considerable interest from their probable connection with health and disease, and from the new pathological views which a full investigation of the subject might suggest.

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* Mr. Brande, in his "Observations on Albumen, &c." published in the Philosoph. Transact. for 1809, has made an ingenious attempt to explain the agency of alkali in albuminous fluids; and Professor Berzelius, in his interesting paper on Animal Fluids, which was published in the third volume of the Society's Transactions, previous to the reprinting of this volume, has considered the alkali of the animal fluids as neutralized, almost entirely, by the lactic acid. From my method of operating, I could not be led to suspect this mode of combination, since in separating the salts from the animal matter by incineration, any destructible acid would necessarily escape detection.

TABLE

Shewing the proportions of saline and animal matter in various dropsical or serous fluids, and in the serum of blood.

		In 1000 grs. of Fluid.		
	Specific Gravity.	*Total of Solid Contents.*	*Quantity of Animal Matter.*	*Quantity of Saline Matter*
		Grains.	*Grains.*	*Grains.*
Fluid of Spina Bifida	1007	11,4	2,2	9,2
——— Hydrocephalus	1006,7	9,2	1,12	8,08
——— Ascites	1015	33,5	25,1	8,4
——— Ovarian Dropsy	102[illegible],2	—	—	8,0
——— Hydrothorax	1012,1	26,6	18,8	7,8
——— Hydrops Pericardii	1011,3	33	25,5	7,5
——— Hydrocele	1024,3	80	71,5	8,5
——— Blister	1024,1	—	—	8,1
Serum of Blood *	1029,5	100	90,8	9,2

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* The specific gravity here stated is an average. That of the particular specimens under examination was 1024,5, as to the saline substances; and 1029,8, as to the animal matter.

P. S. I have, since the first publication of this paper, taken the specific gravity of ten specimens of human serum, which yielded a mean specific gravity of 1029,0. The heaviest specimen was from a diabetic patient, and weighed 1035,4; the lightest, which was taken from an emaciated consumptive person, weighed 1027,1.

CASE

OF

A WOMAN,

WHO VOIDED A LARGE NUMBER OF WORMS BY THE URETHRA;

WITH

A DESCRIPTION OF THE ANIMALS.

BY W. LAWRENCE, ESQ.

ASSISTANT SURGEON AND DEMONSTRATOR OF ANATOMY AT
ST. BARTHOLOMEW'S HOSPITAL.

Read Nov. 12, 1811.

THE origin of those animals which inhabit the internal parts of living bodies, is involved in much obscurity. Although the intestinal worms appear manifestly, from their peculiar form, consistence, and organs, to be particularly designed for those situations in which they are found; although they have generative organs, and no similar animals are known to exist out of living bodies, yet it has been generally conceived that the germs from which they spring enter by the mouth *. The production of hydatids in various parts of the body, cannot, however, be accounted for on such a supposition; neither can we very easily conceive that ova should enter from without, into the urinary organs. In this point of view, the case which I am about to detail is interesting, as it exhibits an unquestionable instance of peculiar and undescribed worms voided from the urinary passages.

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* The following facts, stated by Goeze, entirely overturn this opinion. Professor Brendel, of Göttingen, found ascarides in the rectum

The instances in which worms are said to have been voided from the urinary bladder are very numerous *, but I know no other case than the present, in which a distinct species of worm has been clearly proved to come from that organ. In the recorded instances, most were the common intestinal round worms, which may easily have gained admission into the bladder. These worms sometimes perforate the intestines, and are discharged by abscesses; sometimes the bowels become adherent to the bladder, so that their contents, of various kinds are voided with the urine;

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rectum of an immature embryo. Blumenbach discovered tæniæ in the intestinal canal of young dogs a few hours after birth. Bloch saw flukes in a sucking lamb; and Goeze himself met with a tænia of several ells, and many smaller ones, in a lamb of four weeks old. Versuch einer naturgeschichte der Eingeweidewürmer, pp. 55, 56.

* A great number of references is given in Voigtel's Handbuch der pathologischen anatomie, b. iii. p. 337—342. Goeze had never seen any worms in this part of the body, but he refers to Redi for accounts of worms in the kidney of animals.

and in some instances, coagula of blood, mucus, or portions of the mucous coat of the organ, have been mistaken for worms. Some of the descriptions can apply only to larvæ of insects; and I have seen two specimens of these sent from the country, as worms voided from the bladder.

The particulars of the following case were communicated to me by Mr. Barnett, surgeon of St. John Street, who has persevered with great humanity through a long and tedious attendance, and spared no pains in adopting any means which promised the least chance of relief. He has afforded me frequent opportunities of seeing the woman, of examining the worms, and of ascertaining the fact, that they come from the urethra.

Mary Pearson, aged 24, a single woman, of a healthy and strong constitution, was seized in the winter of 1806, with retention of urine, requiring the daily use of the catheter. Her circumstances rendered it necessary that she should go into an hospital. She complained of great weight in the bladder, pain about the loins, and numbness of the thighs; she seldom passed any water, and, when she did, only a few drops, much tinged with blood. It was deemed a case of calculus, but nothing of that nature could be detected by the sound. After remaining a long time in this place without any relief, she left it, and placed herself under the care of a medical man, who used the catheter twice daily; she then went into another hospital, where the same opinion was entertained of the nature of her disease. In the summer of 1809 she became a patient of Mr. Barnett, and informed him of the preceding particulars. At this time her constitution was greatly disturbed, and she was much emaciated. Her tongue was furred, and frequently assumed a typhoid appearance: her appetite was entirely lost; she complained of pains in the loins and bladder, and had passed no water for the last six months, except by the assistance of the catheter. About this time she was seized with violent fits whenever the use of the instrument was delayed longer than usual, or when the pain and burning heat in the bladder were particularly great. Leeches and fomentations to the region of the bladder were employed; the state of the bowels regulated by oleum ricini and uva ursi taken daily; some sandy matter and urine were brought away by these means.

As the symptoms denoting the existence of some mechanical irritation in the bladder were still unrelieved, Mr. Barnett sounded without finding any indication of stone; the examination gave great pain, and produced in the patient a sensation as if the instrument had struck against a ball at the top of the bladder. From this time the sense of weight became more considerable, and she felt a fluttering within her, as if something was moving; this was so distressing as to oblige her to continue constantly in bed, to which she has since been almost entirely confined; the quantity of urine had become considerably diminished; it had been necessary at first to use the catheter twice a day; afterwards once a day, once in two days, and lastly once in three days was sufficient. She went on till the beginning of August, using such means as are generally employed in affections of the bladder, without the slightest alteration. In fact, her constitution was daily suffering more and more. She was unable to get up, and continually tormented with a distressing pain in the head, which she had never felt before. The least noise alarmed her. The appetite was entirely gone, and she took nothing but liquids in very small portions: she could get no sleep without large doses of opium. The fluttering in the bladder was more violent, and according to her own account, so strong as to be perceptible to the hand; and the bladder itself much distended, even after the water had been drawn off, and so tender that the weight of the bed clothes could not be borne. A very careful examination was again made with the sound, and produced the same feeling as before, of its striking against a ball in the bladder. This was followed by an exceedingly violent convulsive fit, in which the patient was so agitated, that five or six persons were required to hold her.

She seemed in the greatest agony, and much like a person in tetanus. She remained more than half an hour totally insensible to every thing around her: on her recovery, she said that the lump was evidently removed by the instrument from the top of the bladder, and pressed very heavily against the neck; and that the fluttering was very violent. Fits of this kind have since taken place repeatedly. In order to prevent any mischief from over distension of the bladder in the night, particularly as not more than two ounces of urine were voided during the examination, the catheter was left in the urethra. She passed a very restless night; the motion in the bladder was very distressing, and, although the urine had escaped as fast as it was secreted, the bladder seemed greatly enlarged. Mr. Barnett was much surprised, on removing the catheter, to find insinuated through its orifices, what appeared to him a roundish worm, about the size of a piece of bobbin, an inch and a half in length, and of a white colour. At this time Mr. Barnett gave me an opportunity of seeing the case; we examined very carefully with the sound with the same result as before, and agreed that the catheter should be again left in the urethra, in order to throw further light on the cause of the patient's sufferings. Three worms were now brought away, two of them most curiously entangled in the orifices of the instrument, and the third coiled round the end.

As we had now gained some information concerning the cause of the symptoms, Mr. Barnett attempted for its removal, at my suggestion, to dilate the urethra on the plan recommended by Mr. Thomas in the first volume of the Medico-Chirurgical Transactions. The sufferings of the patient were so considerable, that this could not be followed up to the desired extent. The effects of the oil of turpentine in cases of tænia, determined us to try that remedy. Two drachms were given at bed-time in a little warm beer, producing no other sensation than that of a pleasant warmth at the stomach. The influence of the medicine on the urinary secretion was very manifest by its subsequent effects; the bladder was painfully distended on the following morning, although the water had been drawn off the evening before, and at this time the catheter was used only once in three days. A pint and a half of urine was evacuated. A double quantity of the medicine was repeated in the evening, producing no other effect than a profuse perspiration during the whole of the night, and a strong inclination to make water in the morning; she made no effort to assist this disposition, as the length of time for which the catheter had been employed, made her suppose it would be useless. The feeling became at last so urgent that she yielded to it, and passed a pint and a half of water containing four worms; the only natural evacuation of urine she has had during Mr. Barnett's attendance. The continuance of this treatment did not produce success corresponding to such flattering appearances. The medicine, on the fourth time of using it, produced most violent pain in the head, and much fever, which was followed by erysipelas over the whole body, but more particularly in the face. All subsequent attempts to use it, even in diminished doses, were attended with a recurrence of these symptoms. From the first trial of the oleum terebinthinæ, however, to this time, the patient's health was on the whole very considerably amended; she recovered her appetite, rested at night without opium, and was so much relieved from the feelings about the bladder, that she could remain up four or five hours in the day. Mr. Barnett now injected into the bladder equal parts of the oleum terebinthinæ and water, which produced only, according to the patient's expression, an increased fluttering in the worms. On withdrawing the catheter, four worms came away. The repetition of this injection produced the same constitutional irritation and erysipelatous inflammation, as the internal use of the medicine had before done. The fits, which had before so much distressed her, were again renewed.

As these means had failed, Mr. Barnett introduced on the 22d of February, a very large catheter, open at the end and furnished with a stilette, that filled the orifice when it was introduced; on withdrawing the stilette, a free passage was left for the contents of the bladder. In less than half an hour nine worms came through, with a table-spoonful of sandy matter. Four of these were five inches and a half in length. Five more worms came away on the 24th, and one on the 25th. On the next night the patient was very restless, and the motion in the bladder so painful as to cause fits. On the 28th three worms passed; March 2d, nine large ones; 6th, four; 9th, five; 17th, four; 23d, five; 26th, two; April 5th, seven; 6th, seven. On the 13th of April equal parts of ol. terebinth. and water were injected; twelve worms came away; on the 17th, three parts of turpentine with one of water were injected, and thirteen came away; on the 20th, turpentine alone was thrown in, and ten were discharged. Slight motion of an undulating nature was observed in some of these, but they were mostly dead; sometimes the worms that had passed through the catheter were observed as low down in the bed as the patient's feet. She conitnued discharging worms in much the same way; and Mr. Barnett supposes that there have been as many as 600 voided. In one instance a portion of mucus came away, involving several small worms, from half an inch to an inch in length, which lived in the urine for three days, and moved very briskly.

April, 1811, she remains in the same condition; the catheter is employed once in two or three days, and the urine is scanty in quantity, but little altered in quality; worms always came with it in different numbers; twenty-two is the greatest number discharged at once, excepting when the small ones came away. Mr. Barnett has lately used olive oil as an injection. The irritation seems less, and the fits after its employment are less violent. Worms come away whether injections are employed or omitted, but in greater number when they are used.

October, 1811.—A large abscess formed near the vagina in June, attended with severe constitutional symptoms, and every appearance of the patient's sinking; when it burst into that cavity, she was greatly relieved. A large quantity of unhealthy matter was discharged, and eight or ten ounces have been voided daily ever since; a worm came with it in one instance. She is on the whole tolerably well at present, and has a good appetite; but her inability to move, the discharge of worms with the urine, and the occasional fits continue the same. The whole number discharged up to this time cannot be less than from 800 to 1000.

In the accompanying drawing are represented a large and a small worm of the natural size. The latter were only voided on one occasion.

The large worms are mostly from four to six inches in length, and the largest was eight inches; they are slender in the middle, where they appear uniformly almost as if broken; they increase gradually in both directions from this middle point, and then decrease again to the two extremities. When placed in water, after immersion in spirits, they are bent at this middle point, and lie in the form represented in the drawing. The surface exhibited in the picture has the appearance of a double row of small protuberances, and these degenerate towards the pointed extremities into a thin floating edge. On the opposite aspect the body is grooved, and has two rising edges. When it is cut through by a transverse section, the figure is nearly square. They are soft when first voided, and of a yellowish hue. I could not discover any arrangements of parts by dissection; the body seems homogeneous throughout, and careful microscopical observation did not shew any thing concerning their organization.

The numerous figures and descriptions of Goeze do not make us acquainted with any such worms.

The smaller worms were semitransparent when first voided; they became perfectly opaque by immersion in spirits. Their form is rounded, and the two ends are pointed. Microscopical examination of these proved no more instructive than that of the former.

SOME ACCOUNT
OF THE
EFFECTS OF ARSENIC
IN COUNTERACTING
THE POISON OF SERPENTS;
COMMUNICATED
IN A LETTER FROM
MR. J. P. IRELAND,
SURGEON TO THE FOURTH BATTALION OF THE SIXTIETH REGIMENT OF FOOT,
TO
THOMAS CHEVALIER, Esq.

Read Nov. 12, 1811.

SIR,

HAVING heard you mention in your Lectures, "that the Indians were in the habit of administering arsenic in large doses, after the bites of venomous animals; and that you would strongly recommend to gentlemen who might have opportunities of trying its effects in such cases, to exhibit it, in order to ascertain its powers," I resolved to make trial of it whenever an opportunity offered; and I have great pleasure in having it in my power to acquaint you with the following important facts, which occurred under my own observation during several years' residence in the West Indies.

In some of the islands at present in our possession, venomous serpents are very numerous, and one of the most deadly in its bite is found in the island of St. Lucia; it is from three to six feet in length, and appears to be the *Coluber Carinatus* of Linnæus. Its fangs are from one and a half to two inches long *; and the wound inflicted by them is generally of considerable extent.

On my arrival in the island, I was informed that an officer and several men, belonging to the 68th regiment, (then quartered there, and to which I was attached,) had died within a few months from the bites of those destructive animals; that every thing had been tried by the attending medical men, to no purpose, as all the patients had died, some in six, and others in about twelve hours, from the time of their receiving the wound.

A case, however, soon came under my own care, and as nothing that had been done before seemed to be of any avail, I determined on trying the effects of arsenic to its full extent.

---

* Several specimens of the fangs I brought home with me have been unfortunately mislaid. I hope, however, to be able to shew them to you soon.

CASE I.

Jacob Course, soldier in the York Light Infantry Volunteers, was bitten in the left hand, and the middle finger was so much lacerated, that I found it necessary to amputate it immediately, at the joint with the metacarpal bone.

I first saw him about ten minutes after he had received the wound, and found him in a torpid, senseless state: the hand, arm, and breast of the same side were much swelled, mottled, and of a dark purple, and livid colour. He was vomiting, and appeared as if much intoxicated. Pulse quick and hard: he felt little or no pain during the operation.

The wound being dressed, and the patient put to bed, I ordered a cathartic clyster, and the following medicine to be taken immediately: ℞ Liq. Arsenic. ʒii *; Tinct. Opii gt. x. Aq. Menth. Pip. ℥iss.; which was added to half an ounce of lime juice, and as it produced a slight effervescence, it was given in that state: this remained on his stomach, and was repeated every half hour for four successive hours. In the mean time the parts were frequently fomented with common fomentation, and rubbed with a liniment composed of Ol. Terebinth. ʒss.; Liq. Ammon. ʒss. and Ol. Oliv. ℥iss. The cathartic clyster was repeated twice when the patient began to be purged; the arsenical medicine was now discontinued. He had become more sensible when touched, and from that time he gradually recovered his faculties; he took some nourishment, and had several hours' sleep.

---

* The Solutio Mineralis Arsenici was carefully prepared by myself agreeable to Dr. Fowler's prescription; which directs sixty-four grains of arsenic, and as many of the fixed vegetable alkali, to be dissolved in a sand heat, and the solution to be made an exact pint, so that two drachms contain one grain of arsenic in solution.

The next day he appeared very weak and fatigued; the fomentation and liniment were repeated. The swelling diminished gradually; the natural colour and feeling returned, and by proper dressings to the wound, and attention to the state of his bowels, he soon recovered and returned to his duty.

CASE II.

—— Dover, a black soldier in the 3d West India Regiment, was bitten in the left hand; the swelling was not so extensive as in the former case, and the discoloration was not so strongly marked. I saw him within a few minutes after he was bitten, and vomiting, senselessness, and torpor, had commenced. The wound inflicted was not of so large extent; I removed the torn edges of the lacerated integuments, dressed the wound, and gave him the arsenical medicine precisely as in the former case; the fomentation and liniment were also applied, the cathartic clyster given every hour, and the medicine repeated every half hour for four hours, when purging came on, and the medicine was discontinued, after which he had some hours' repose.

The next day he appeared less debilitated, and he soon recovered, and returned to his duty.

CASE III.

Thomas Rally, of the 68th regiment, was bitten in the calf of the right leg, and brought to the hospital in nearly the same state as Jacob Course; the ragged edges of the integuments were immediately removed, the wound dressed, and the arsenical medicine administered; a cathartic clyster was ordered, and the fomentation and liniment applied. After he had taken the medicine every half hour for three hours, severe vomiting came on, so that the stomach rejected every thing that was taken: the cathartic clyster was, however, repeated every hour for four hours, when purging came on. In about two hours afterwards the vomiting ceased, and he took Tinct. Opii. gt. xx.;

Spt. Æther. Vitr. gr. xv.; Aq. Menth. Pip. ℥iss.; after which he became quiet, and remained so for several hours.

Next day he was still much debilitated, and had much difficulty in voiding his urine; it was, however, drawn off with a catheter twice a day for two days, and fomentations applied to the region of the bladder. On the 3d day every aggravating symptom began to abate, and from that time he gradually recovered and returned to his duty.

CASE IV.

Patrick Murphy, of the 68th regiment, was bitten in the wrist. I saw him within a few minutes after the wound had been received. The hand and arm of the same side had begun to swell, and were even mottled; but vomiting had not come on. I removed the torn edges of the integuments, dressed the wound, and gave him the arsenical medicine. The cathartic clyster was also ordered, and the fomentation and liniment applied; he took the medicine every half hour for three hours, when he appeared much recovered, and it was discontinued. The symptoms did not run so high as in any of the former cases. The fomentation and liniment were continued for two days, from which period he gradually recovered and returned to his duty.

These were the only cases I had an opportunity of seeing during my stay in St. Lucia; but some time after I went to the island of Martinique, where a venomous serpent is found of a smaller size, from one to two, and two and an half feet long, and its fangs about an inch in length, the bite of which is as deadly as of those found in St. Lucia. I was present when a soldier belonging to the 63d regiment received a wound in the leg from one of those serpents, and I requested the surgeon of the regiment to allow me to try the effects of arsenic; he was very glad to give me the case, as he had not before seen one of the kind.

The patient was treated precisely in the same manner as those in St. Lucia, and when I left the island on other duty, a few days afterwards, I had the pleasure to leave him so well, that I do not entertain a doubt of his having perfectly recovered.

From this it appears that very happy effects may be produced by the administration of arsenic in large doses, in cases of this nature, as every one in which I tried it recovered; and, I trust, these facts will be the means of throwing some light on a subject of the greatest importance to the inhabitants of our colonies, and will be found to merit the attention of those who are more competent to reason on the nature of the effects thus produced.

I have the honor to be, Sir,
Your most obedient and humble Servant,
J. M. IRELAND,
Surgeon 4th Batt. 60th Regt.

London, Oct. 21, 1811.

Note by Mr. Chevalier.

I was induced to recommend the trial of arsenic in these cases from the facts recorded in Dr. Russell's History of Indian Serpents, on the authorities of Mr. Duffin and Mr. Ramsay, and of which a good account may be found in the London Medical Review and Magazine for March and April 1799. From these it appears that the Tanjore pill, of which arsenic is in all probability the chief ingredient, is exhibited with considerable success in India after the bites of venomous serpents. The composition of this medicine is as follows: "White arsenic, roots of vellinavi, roots of neri-visham, kernels of nervalam, pepper, quicksilver, of each an equal quantity. The quicksilver is to be rubbed with the juice of the wild cotton till the globules become invisible. The arsenic being first levigated, and the other ingredients reduced to a powder, are then to be added, and the whole beaten up together with the juice of the wild cotton to a consistence fit to be divided into pills of six grains each." Each pill, therefore, contains nearly one grain of arsenic, which is given in the state of white oxyd. It was a matter of doubt with me, before I received Mr. Ireland's communication, whether the other ingredients might not have some share in moderating or counteracting the immediate effect of arsenic on the stomach itself. But it did not appear at all unreasonable to suppose that where such sudden and extreme debility is produced as takes place from the bites of serpents, a much larger dose of a powerful remedy might be taken with impunity than could be borne in any ordinary state of the human frame. In Mr. Ireland's cases, the arsenic was also given in the state of white oxyd, as the liquor arsenicalis would be decomposed by the lime juice; but the medicine being swallowed instantly as that decomposition was effected, the arsenic would be more diffused in the stomach than if exhibited in a pill; and perhaps this mode of giving it is on that account to be preferred.

In two out of three of the successful instances related by Dr. Russell, the Tanjore pill produced copious vomiting; in one purging also, and in one the operation was gentle by stool and perspiration only. In those now read to the Society it seems to have operated chiefly by purging, which was very judiciously promoted by repeated cathartic glysters.

It remains for future observation to determine whether any, and what advantage would arise from giving the arsenic in solution instead of in the state of oxyd; and whether this powerful remedy might not be employed with success in tetanus and hydrophobia. Dr. Russell mentions his having given the Tanjore pill to fourteen persons bitten by mad dogs. It operated by purging; but as the symptoms of hydrophobia do not appear to have supervened, the efficacy of the medicine in that dreadful disease still remains for future experiments to determine.

T. CHEVALIER.

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Explanation of the Plates.

Plate I. illustrates the effect of the operation performed by Mr. Travers in the case of Aneurism by Anastomosis in the Orbit. See p. 14.

Plates II. III. and IV. refer to the case of Sarah Rogers, described by Mr. Chevalier, p. 63.

Plate II. *fig.* 1. exhibits the general appearance of the limb affected, and its proportion to the rest of the body, p. 66.

Plate III. *fig.* 2. represents more particularly the appearance of the foot, p. 66.

Plate IV. exhibits some of the morbid changes in the papillæ of the cutis, described p. 68.

Plate V. illustrates the changes in the cutis in Elephantiasis, described pp. 70 and 72.

Plate VI. Two views of the limb operated on by Mr. Cooper for Popliteal Aneurism. See p. 256.

fig. 1. Anterior view of the limb.
- *a.* Iliac artery.
- *b.* Femoral artery.
- *cc.* Obliterated femoral artery.
- *d.* Profunda and circumflex arteries.
- *e.* Sartorius muscle.
- *ff.* Anterior tibial artery.

fig. 2. Posterior view.
- *g.* Gluteal artery.

Fig 1.

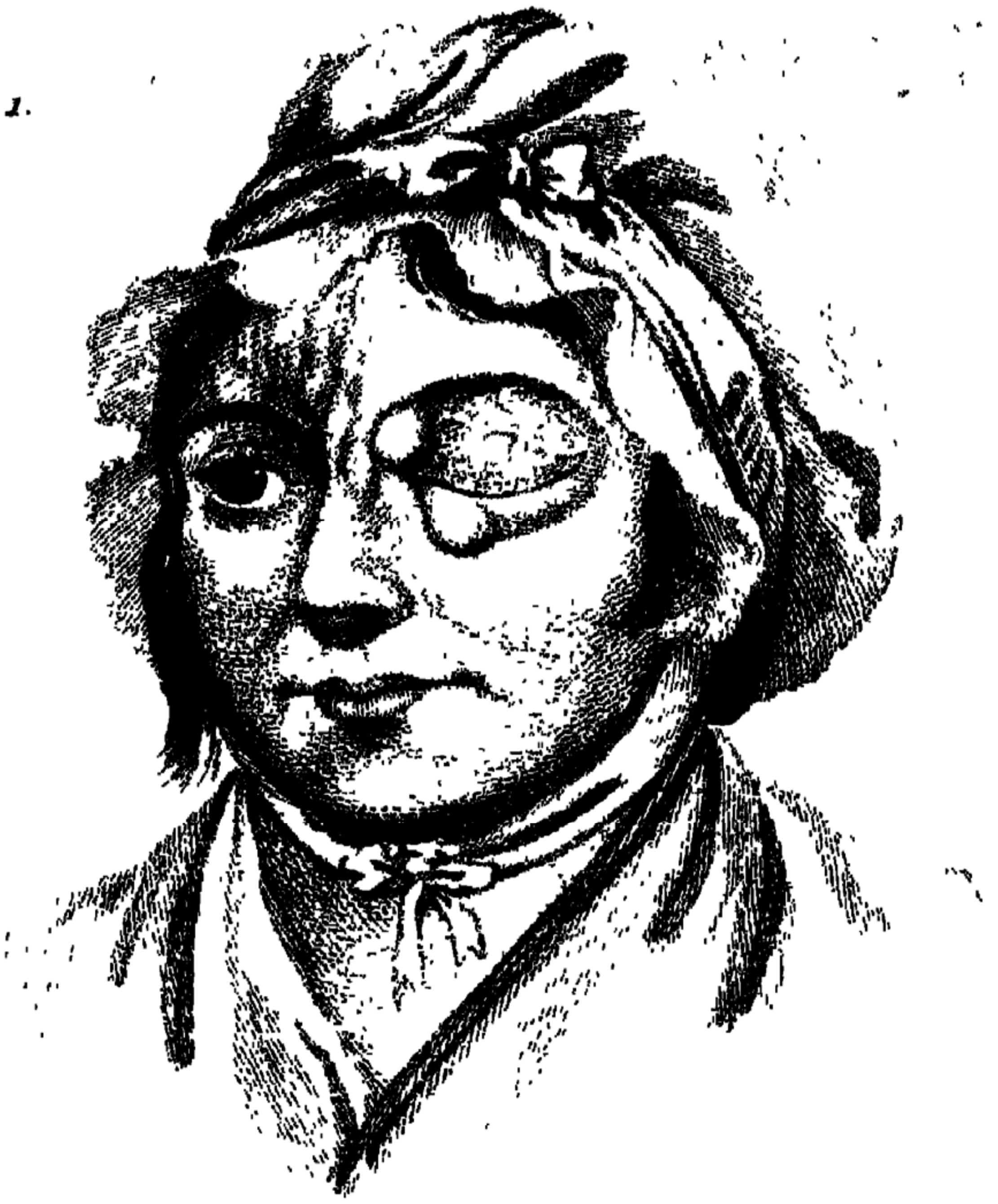

Fig 2

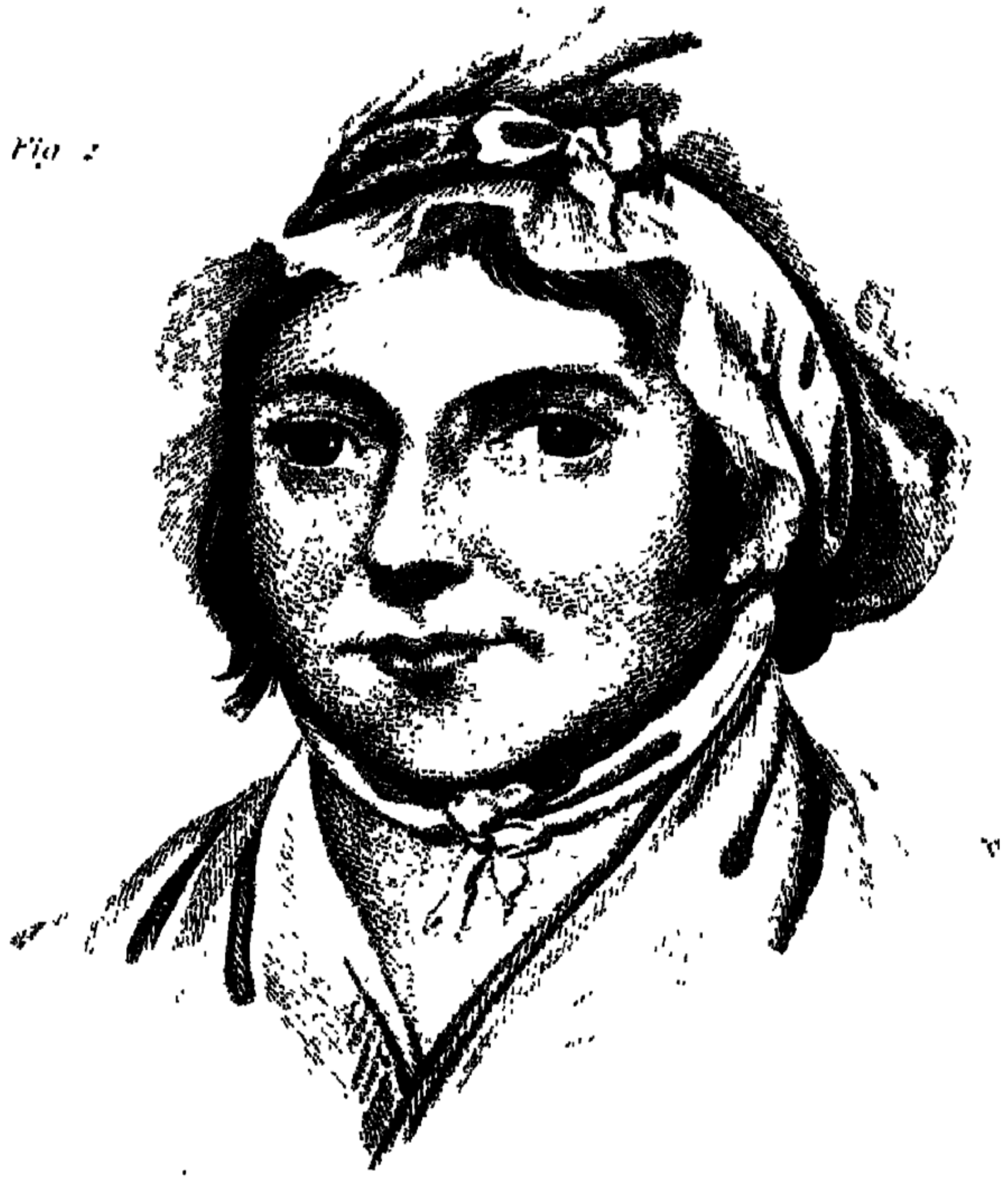

Fig 1 Portrait of Frances Storhill previous to the operation

Fig 2 Portrait of the same two years after the operation

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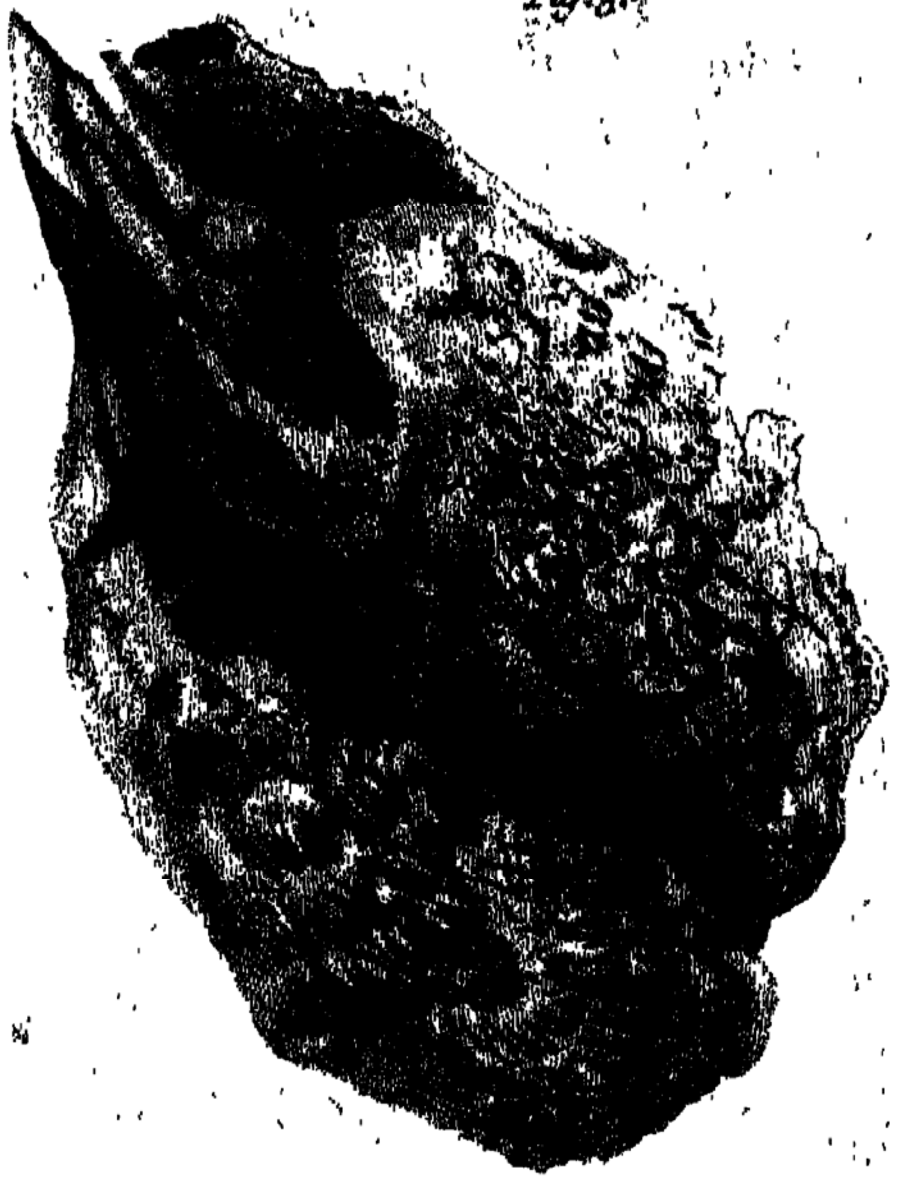
Plate 3

Fig. 3.



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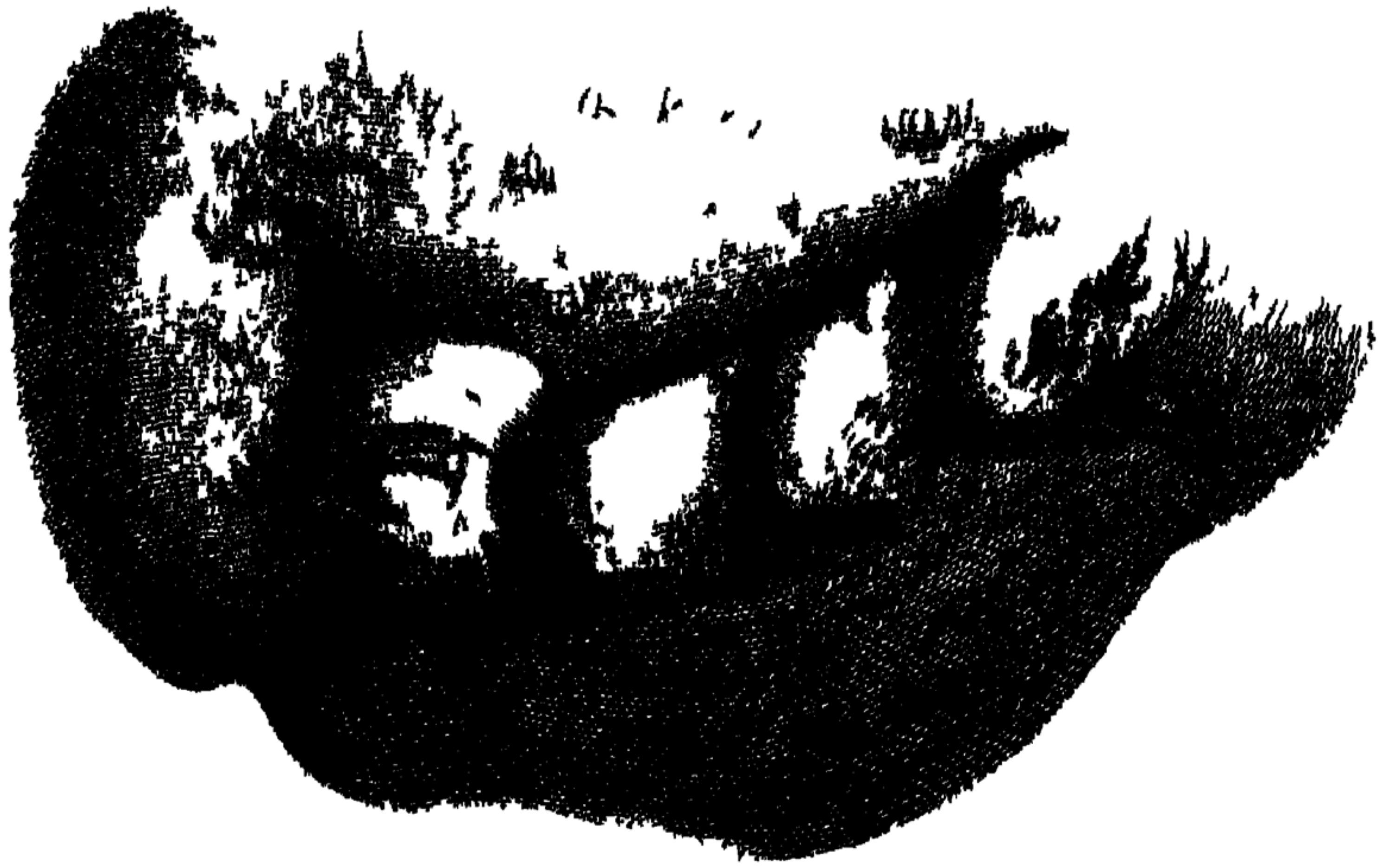

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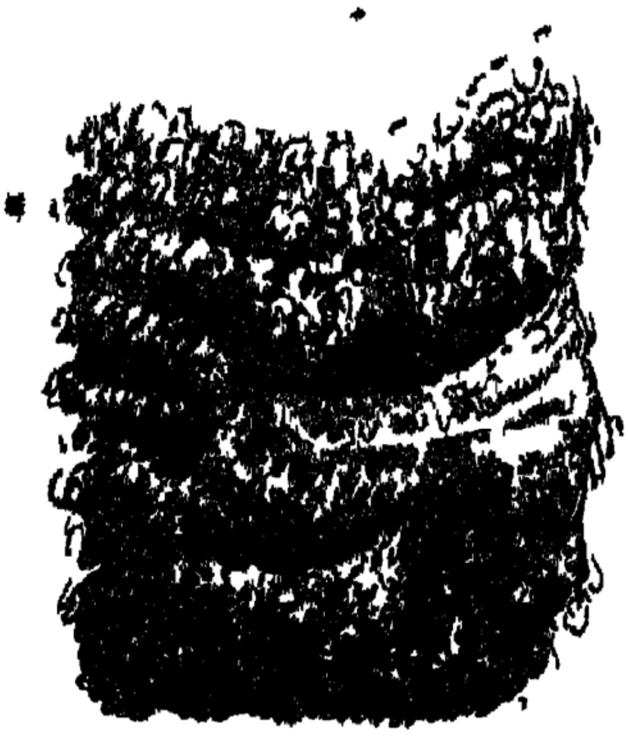

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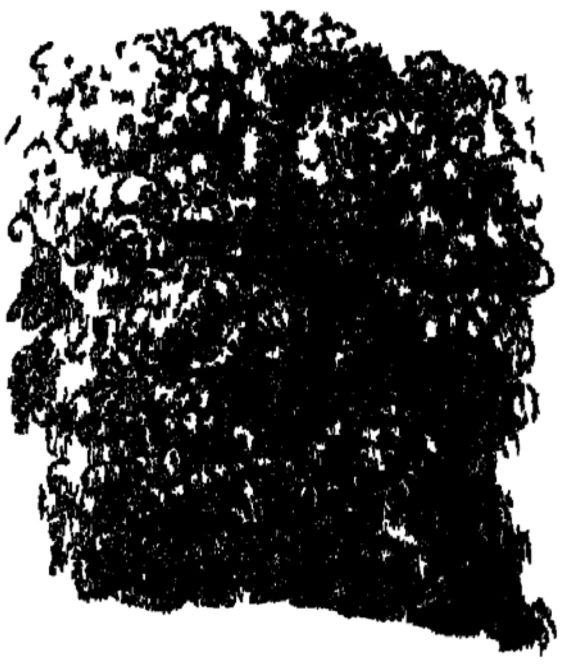

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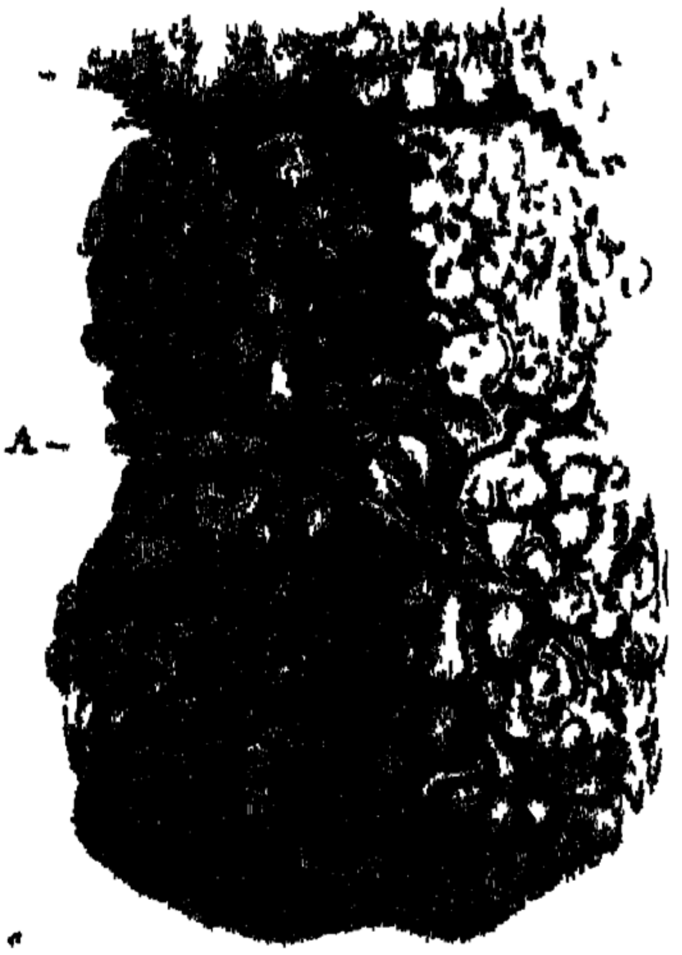
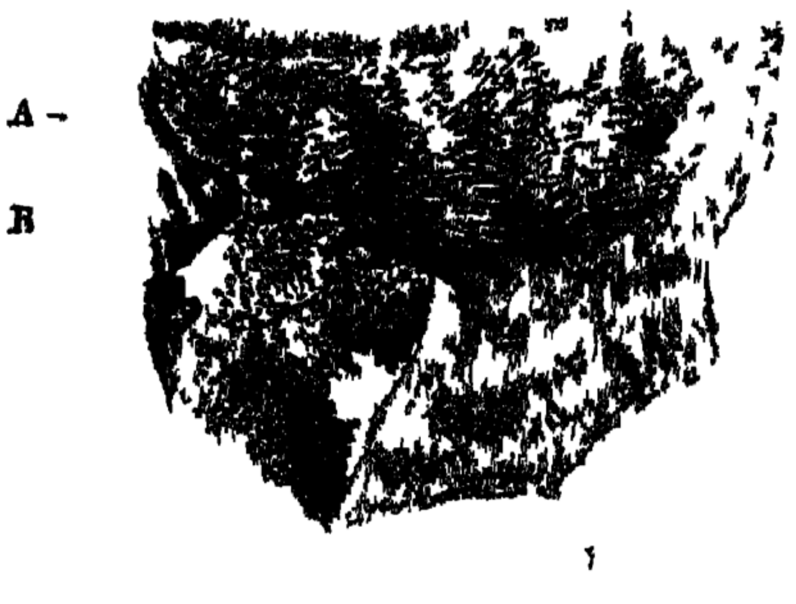


Fig. 8



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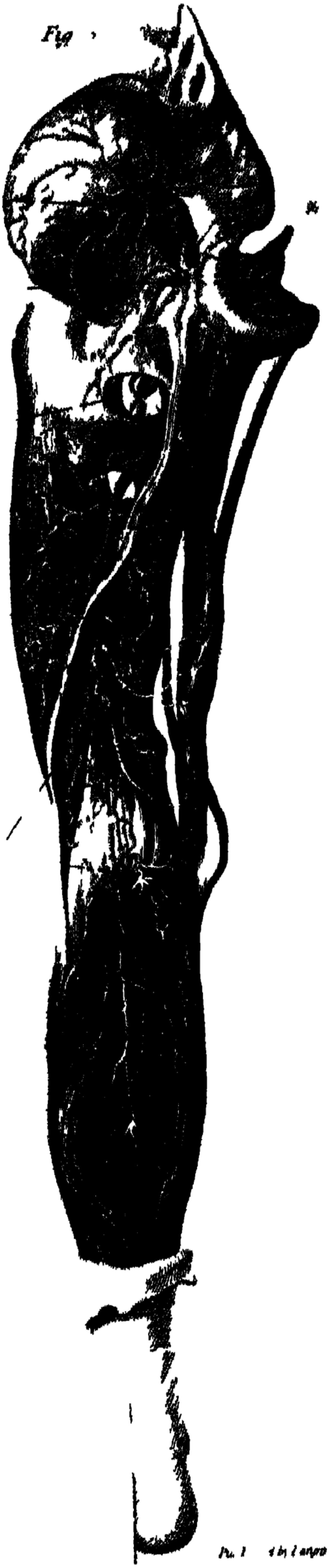

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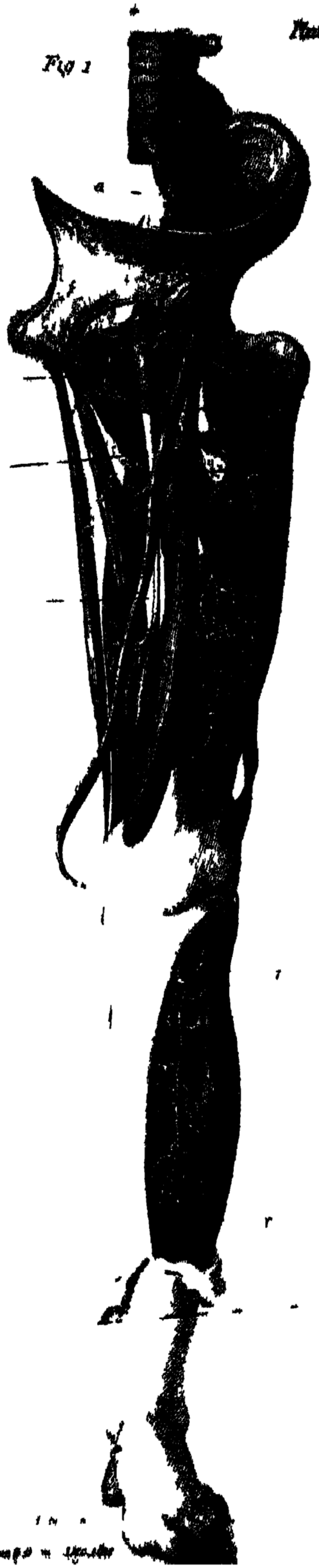

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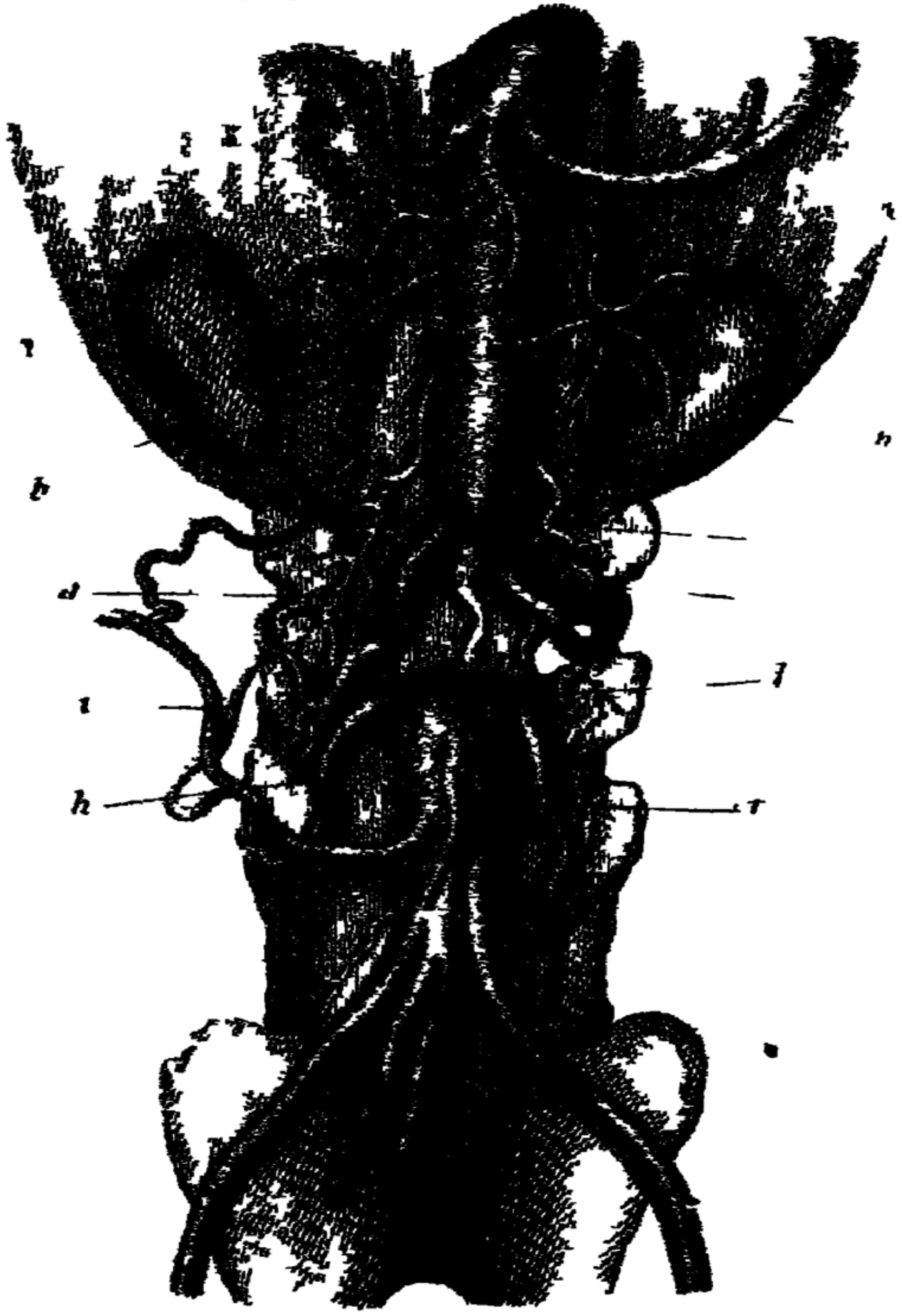

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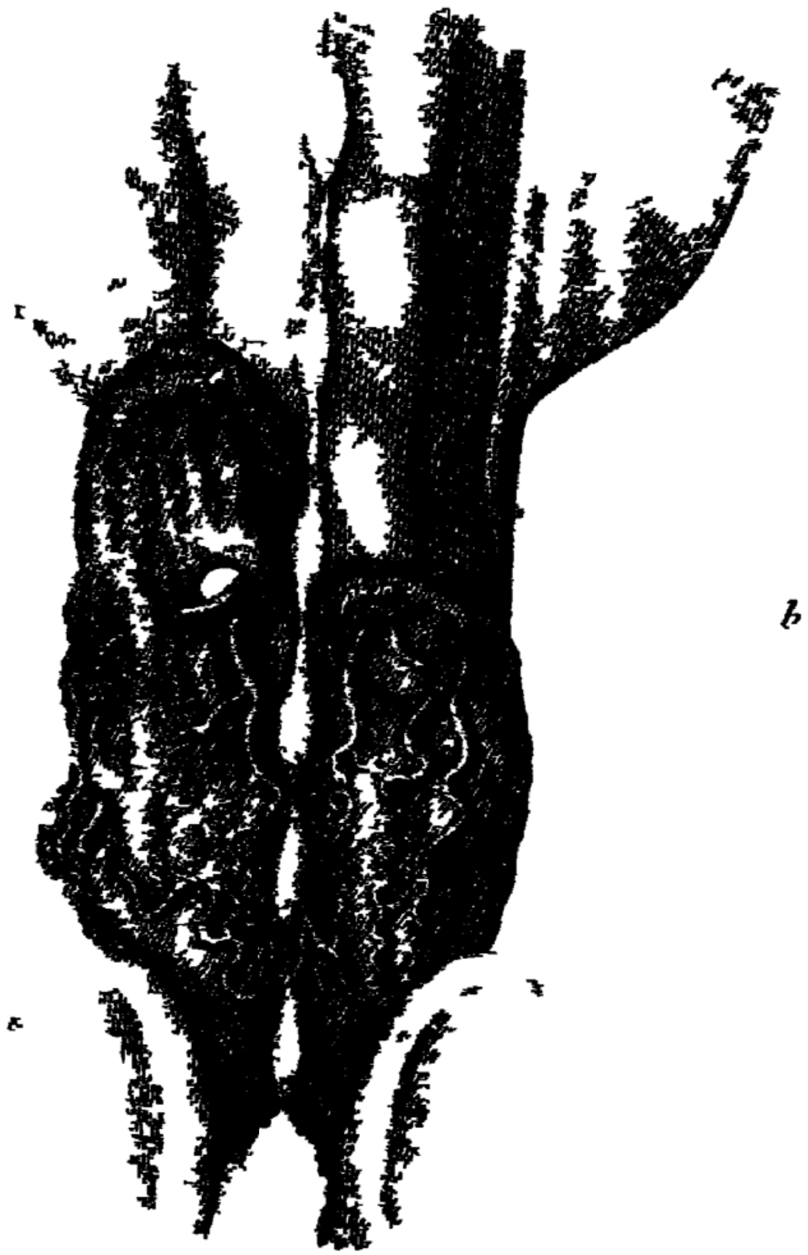

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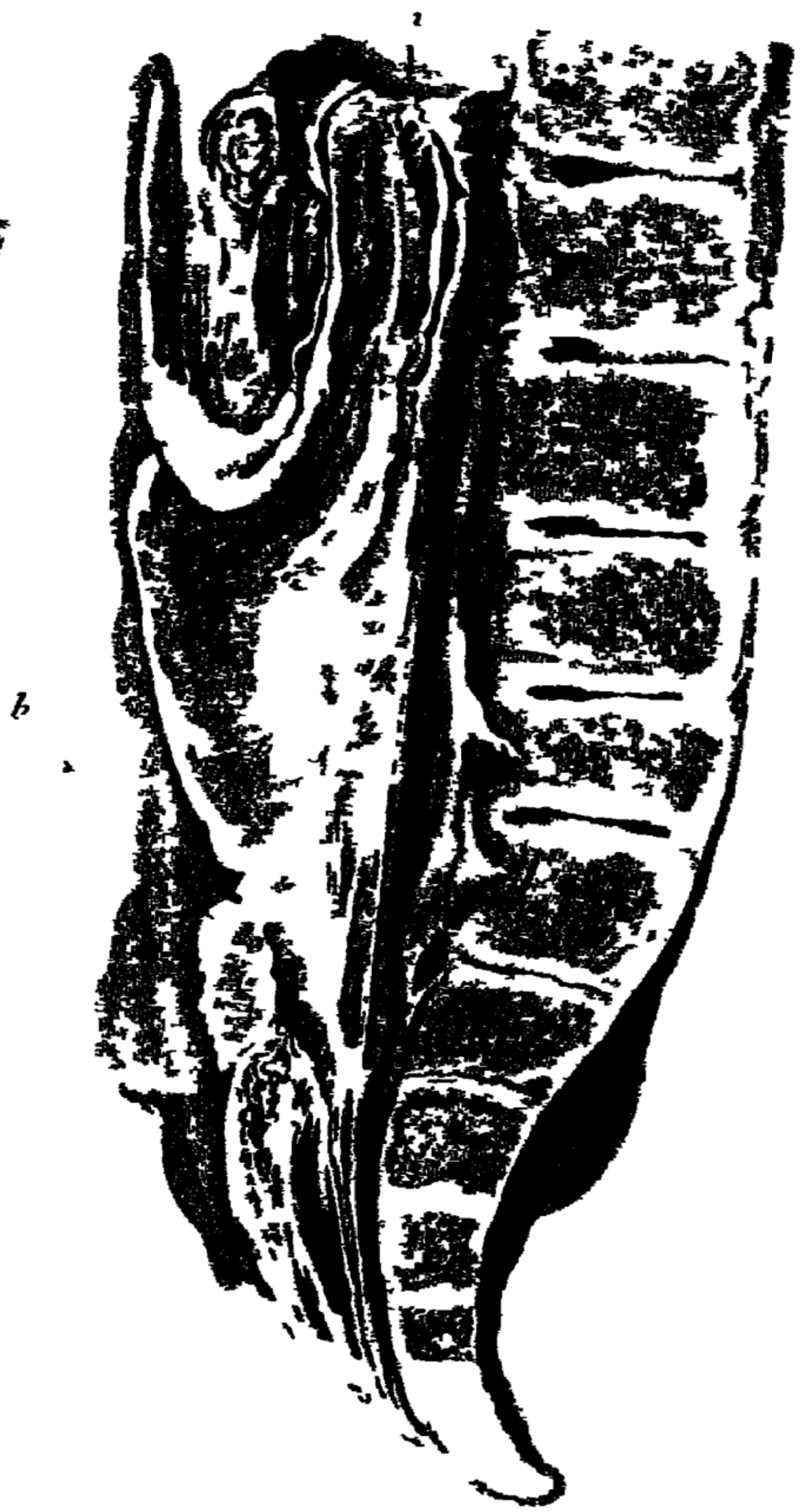

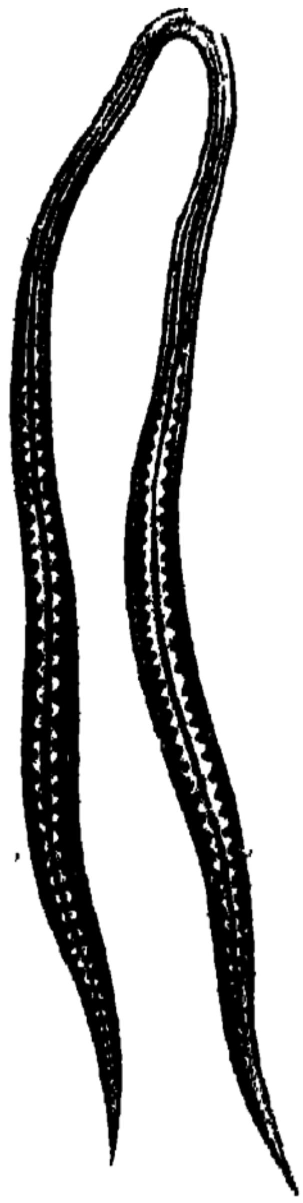

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h. Ischiatic artery.

ii. Arteria profunda.

k. The enlarged communicating branches between the profunda and posterior tibial artery, *(for the popliteal artery was obliterated.)*

l. Lower tibial artery.

m. Interosseal artery.

Plate VII. Anterior and posterior views of the spine of a dog, in which the aorta was divided, (p. 260.); and a view of a case of Spina Bifida in which adhesion had been produced in the dura-matral sac. p. 334.

fig. 1. Anterior view of the Spine.

a. Aorta.

b, *b.* The kidneys.

c, *d.* The divided aorta.

e, *f*, *g*, *h.* Lumbal arteries enlarged and anastomosing.

i. Other communicating branches.

fig. 2. shews the lumbal arteries enlarged and communicating upon the posterior part of the spine.

fig. 3. Section of Spina Bifida.

a. Spinal marrow.

b. The sac contracted and filled with adhesive matter. The extent of the deficiency of the spine is also seen.

Plate VIII. The appearance of the worms, voided from the urethra. See p. 394.

INDEX

TO THE

FIRST AND SECOND VOLUMES.

A.

Vol. Page

ABERNETHY on a diminution of the area of the aperture between the left auricle and ventricle of the heart .... I. 27.
——— on an uncommon disease of the ovarium I. 35.
Abdomen of a boy, fœtus found in the .... I. 234.
Acids, their action on albumen .... II. 176.
Aiken, test of potash........ II. 357.
Albumen, theory of its coagulation by different agents... II. 174.
Alcohol, its action on albumen .... II. 176.
Alkali contained in serum .... II. 368.
Alkalies, as remedies for pertussis .... I. 25.
Alkaline matter in animal fluids .... II. 355.
——— sulphat in serum........ II. 372.
Amputation at the shoulder joint, case of .... II. 266.
Anæsthesia, singular instance of........ II. 217.
Analysis of different morbid animal fluids........ II. 342.
Anastomosis, aneurism by........ II. 1.
Aneurism of the carotid artery, a case of........ I. 1.
——— a second case of........ I. 222.
Aneurism by anastomosis in the orbit........ II. 1.
——— of the aorta, producing dysphagia........ II. 244.
——— popliteal, dissection of the limb after the operation for........ II. 251.
Animal fluids, analysis of .... II. 342.

Vol. Page

Animal matter in the fluid of spina bifida.................. II. 346.
——— matter in various dropsical fluids, table of......... II. 384.
Anus, artificial dilatation of.................................... I. 129.
Aorta, aneurism of, producing dysphagia.................. II. 244.
——— tied in dogs.. II. 259.
Armiger's case of dysphagia from aneurism of the aorta... II. 244.
Arsenic, employed in hydrophobia........................... I. 141.
——— case of recovery from................................... II. 137.
——— its effects in counteracting the poison of serpents... II. 396.
———, a new test for the detection of...... .... II. 157.
Ascites, analysis of the fluid of.............................. II. 359.
———, general contents of the fluid of...................... II. 363.
Asphyxia from the vapour of burning charcoal.............. I. 83.
——— idiopathica .... I. 162.
Astringents, on their employment in dysentery........... II. 187.

B.

Babington, Dr. case of asphyxia from the vapor of burning charcoal .... I. 83.
Baillie, Dr. account of morbid appearances in the heart... I. 40.
Barbadoes leg distinguished from elephantiasis .... II. 71.
Barnett, case of worms from the bladder..................... II. 385.
Bateman, Dr. cases of secondary small-pox.............. II. 31.
Bladder inflamed after lithotomy.............................. I. 105,
———, on its condition after lithotomy...................... II. 206.
———, worms contained in the............................... II. 385.
Blizard, Tho. case of intus-susceptio .... I. 169.
Blood, on the gelatine of the.................................... I. 47.
———, on the serum of the....................................... II. 162.
——— ———.. II. 365.
Blood-letting employed to counteract the effects of arsenic II. 153.
——— tried in diabetes .... II. 134.
Bostock, Dr. on the gelatine of the blood..................... I. 47.
——— experiments on the effects of corrosive sublimate.. II. 152.
——— on the tests of arsenic...................................... II. 160.
——— experiments and observations of the serum of the blood.................................... II. 162.

Vol. Page

Brain, a case of tumor in the I. 181.
——, on the anatomy of the I. 218.
——, on the circulation in the II. 15.
——, hernia of the II. 52.
——, hydatid in II. 262.
——, ventricles of the, analysis of fluid collected in them... II. 354.
Bree, Dr. on painful affections of the side from tumid spleen II. 85.
Burrows, case of hernia cerebri II. 52.
Bush, case of a knife lodged in the muscles of the back... II. 103.

C.

Calculus, a case of I. 99.
———, in the joints from gout I. 112.
———, in the bladder, origin of II. 204.
———, analysis of, by Dr. Wollaston II. 210.
Calomel, on its employment in dysentery, &c II. 184.
Carbonic acid, asphyxia from I. 83.
Carotid aneurism, cases of I. 222.
——— artery, ligature of, in a woman I. 3.
Chalk-stones from gout I. 112.
Charcoal, asphyxia from the vapour of I. 83.
Chevalier, account of three cases of sudden death I. 157.
————, history of an extraordinary enlargement in the right lower extremity II. 63.
————, case of lithotomy, and of fistulæ in perinæo II. 201.
————, note on the above case II. 403.
————, note on the Tanjore pill II. 403.
Coagulation of albumen, on the theory of II. 174.
Concretions, gouty I. 112.
Cooke, case of hydrocephalus internus II. 17.
Cooper, cases of aneurism of the carotid I. 1,222.
———, experiments on the effects of the division of the medulla spinalis I. 197.
———, on popliteal aneurism, and the ligature of the aorta II. 251.
——— on spina bifida II. 324.
Corrosive sublimate producing death by its secondary effects II. 152.

Vol. Page

Cough cured by iron.. I. 13.
Cranium, congenital deficiency of........................... II. 52.
——, case of fracture of.................................... II. 309.
Creagh, case of fracture of the cranium.................... II. 309.
Cutis, morbid changes in the papillæ .... II. 63.
——, extensive desquammation of............................ II. 79.
Cutting, *Dr.* case of amputation at the shoulder joint...... II. 266.

D.

Death, sudden, cases of...................................... I. 157.
—— .... II. 236.
Delivery obstructed by tumors in the pelvis................... II. 298.
Desquammation of the cuticle................................ II. 79.
Detection of the presence of arsenic, proposed test for... II. 157.
Diabetes, theories of.. II. 131.
Diabetic urine, chemical examination of...................... II. 119.
Dilatation of the female urethra.............................. I. 123.
—— of the rectum... I. 129.
Distemper in dogs .... I. 263.
Dropsical fluids, analysis of.................................. II. 342.
Dundas, account of a peculiar disease of the heart......... I. 37.
Dura mater, on the puncture of............................... II. 105.
Dysentery, on the mercurial treatment of.................... II. 181.
Dysphagia from aneurism of the aorta......................... II. 244.
Dyspnœa relieved by hemorrhoids............................. II. 89.

E.

Elephantiasis, diagnosis of .... II. 68.
Endemic, fatal, account of.................................... II. 236.
Enlargement of the right lower extremity............... .. II. 63.
Epilepsy produced by arsenic .... II. 147.
—— .... II. 155.
Erythema, a severe case of, unconnected with mercurial action.. II. 73.
Extract from diabetic urine .... II. 123.
Extremity, lower, enlarged.................................... II. 63.

F.

Vol. Page

Featherston, case of wound of the heart.................... II. 58.

Fenwick, Dr. on the use of oil of turpentine in tænia...... II. 24.

Fergusson, on the mercurial treatment of dysentery, &c... II. 181.

Fevers, remitting and yellow, on the employment of mercury, in .... II. 181.

——— .... II. 189.

Fistulæ in perinæo, remarks on.............................. II. 201.

Fluid of spina bifida, analysis of .... II. 344.

Fœtus found in the abdomen of a boy.......... .... I. 234.

——— receiving the infection of small-pox.................. I. 269.

Forster, case of lithotomy.. I. 99.

Fracture of the thigh, united, cured by operation............ II. 47.

——— of the occipital bone.. II. 105.

——— of the cranium.. II. 309.

G.

Gall and *Spurzheim* on the anatomy of the brain............ I. 218.

Galvanism employed in asphyxia .... I. 85.

——— .... I. 95.

Gelatine not contained in the blood .... I. 47.

——— .... II. 162.

Gervis, case of small-pox infection in the fœtus............ I. 273.

Gourlay, Dr. on the treatment of dysentery................ II. 199.

Gouty concretions, examination of.......................... I. 112.

Gray, Dr. on mercurial treatment of dysentery............ II. 197.

H.

Harkness, case of trismus successfully treated.............. II. 286.

Heart, organic affection of .... I. 27.

———, enlargement of.. I. 37.

———, wound in .... II. 58.

Hemiplegia from tumor in the brain.......................... I. 185.

Henry, Dr. experiments on diabetic urine .... II. 119.

Hernia cerebri .... II. 52.

Vol. Page

Hooping cough, remedies in .... I. 23.

Howorth, Philip, case of........................ I. 276.

Hutchison, case of fracture of the occipital bone .... II. 105.

Hydatid in the brain .... II. 262.

Hydatids, fluid of, analysed........................ II. 375.

Hydrargyria .... II. 73.

Hydrocele, fluid of, analysed........................ II. 374.

Hydrocephalus internus, case of .... II. 17.

——————, fluid of, analysed .... II. 353.

Hydrometer to distinguish diabetic urine........................ II. 123.

Hydrophobia, case of .... I. 132.

——————, in dogs, diagnosis from the distemper...... I. 267.

Hydrothorax, fluid of, analysed .... II. 364.

I.

Jelly. See *Gelatine*.

Jenner, Dr on the distemper in dogs........................ I. 263.

——————, cases of small-pox infection communicated to the fœtus........................ I. 269.

Impetigo .... II. 80.

Infection of small-pox received by the fœtus .... I. 269.

Intus-susceptio, case of........................ I. 169.

Ireland, on arsenic against the bites of serpents........... II. 396.

Iron, preparation of, curing cough........................ I. 13.

—— employed in hydrophobia........................ I. 140.

K.

Knife lodged in the muscles of the back for thirty years... II. 103.

L.

Laird, Dr. case of secondary small-pox........................ II. 37.

Laudanum, effects of a large quantity taken internally... I. 77.

Lawrence, case of worms voided from the urethra......... II. 385.

Lithotomy, case of........................ I. 99.

Vol. Page

Lithotomy, case of .... II. 201.

————, note on .... II. 210.

Liver, scrofulous .... II. 22.

——— affected in dysentery .... II. 187.

Locked jaw, cases of .... II. 286.

——————— .... II. 293.

Lower extremities, extraordinary enlargement of .... II. 63.

M.

Magnesia present in animal fluids .... II. 369.

Marcet, Dr. cases of rheumatism translated to the chest I. 44.

——— account of the effects of a large quantity of laudanum .... I. 77.

——— case of hydrophobia .... I. 132.

——— case of paraplegia from a tumor .... I. 195.

——— case of severe erythema unconnected with mercurial action .... II. 73.

——— proposal of a test for the detection of arsenic II. 157.

——— analysis of various animal fluids .... II. 342.

Medulla spinalis, effects of injuries on .... I. 187.

Mercury, oxymuriate of, poisonous effects .... II. 152.

——————— its action on albumen .... II. 177.

——————— as a remedy in dysentery .... II. 181.

Mercurial erythema .... II. 73.

Mesenteric glands enlarged, accompanied by hydrocephalus .... II. 22.

Moore on gouty concretions .... I. 112.

Morrah, case of hydatid in the brain .... II. 262.

Muriate of potash present in animal fluids .... II. 382.

Muscles of the urethra .... I. 175.

N.

Natron as a remedy in pertussis .... I. 25.

Nervous influence, on the propagation of .... I. 181.

Nervous affection, singular case of .... II. 217.

O.

Vol. Page

Occipital bone, fractured and trephined .... II. 105.
Oedema puerperarum .... II. 65.
Oil of turpentine as a remedy in tænia .... II. 24.
Opium, effects of a large quantity of the tincture .... I. 77.
———, employed in hydrophobia .... I. 140.
———, improper in dysentery .... II. 186.
———, successfully used in trismus .... II. 288.
———————— .... II. 294.
Orbit, aneurism by anastomosis in .... II. 1.
Osseous deposit on tentorium .... II. 113.
Ovarium, disease of .... I. 35.
Oxygen, inhalation of, employed in asphyxia........ I. 86, 95.

P.

Painful affections of the side from tumid spleen .... II. 85.
Papillæ of cutis, morbid changes in .... II. 63.
Paralysis from tumor in the brain .... I. 185.
Paralytic affection, singular case of .... II. 217.
Park, cases of tumors in the female pelvis .... II. 298.
Parkinson, case of trismus successfully treated .... II. 293.
Pearson, Dr. on the alkali contained in the blood .... II. 358.
Pearson, Dr. R. on the treatment of hooping-cough .... I. 23
Pelvis, cases of tumors obstructing delivery .... II. 298.
Pemberton, Dr. case of disease of the heart .... I. 42.
Pericardium, fluid of, analysed .... II. 364.
Perinæo, fistulæ in .... II. 201.
Pertussis, on the treatment of .... I. 23.
Phlegmatia dolens .... II. 65.
Poison by arsenic .... II. 137.
——— by laudanum .... I. 77.
——— of serpents counteracted by arsenic .... II. 396.
Potash, muriate of, present in animal fluids .... II. 357.
———, chemical tests of .... II. 357.
———, sulphat of, present in animal fluids .... II. 372.
Pudenda, female, early developement of .... II. 22.

Vol. Page

Puberty, case of premature, in a boy .... I. 276.
———————— in a female .... II. 116.
Puncture of the dura mater .... II. 105.
Purgatives employed in trismus .... II. 288.
———————— .... II. 295.

R.

Rectum, artificial dilatation of ... . I. 129.
Remitting fevers, on the employment of mercury in .... II. 181.
Rheumatism followed by disease of the heart .... I. 38.
Roget, Dr. case of recovery from the effects of arsenic ... II. 137.
——— on the mode of detecting the presence of arsenic .... II. 157.
Rowland's case of ununited fracture of the thigh .... II. 47.
Rutter, case of erythema not produced by mercury......... II. 81.

S.

Salts contained in animal fluids .... II. 384.
Scrofula in the liver and mesenteric glands followed by hydrocephalus .... II. 22.
Serpents, poison of, counteracted by arsenic .... II. 396.
Serum of the blood in diabetic patients, examination of II. 131.
————————, experiments on .... II. 162.
————————, chemical examination of .... II. 365.
————————, results of analysis of .... II. 373.
Small-pox infection communicated to the fœtus .... I. 269.
——— secondary, cases of .... II. 31.
Skin, altered structure of .... II. 67.
Soda employed in pertussis .... I. 25.
——, caustic, present in the blood .... II. 370.
——, chemical tests of .... II. 357.
Specific gravity of diabetic urine .... II. 123.
———— of serum of the blood .... II. 171.
———————— .... II. 366.

Vol. Page

Spina bifida successfully treated .... II. 324.
——— analysis of the fluid of .... II. 344.
——— animal matter of .... II. 346.
——— saline matter of .... II. 347.
——— general contents of .... II. 352.
Spinal marrow, on injuries of .... I. 187.
Spleen, on diseases of .... II. 85.
Stanger, Dr. case of cough cured by iron .... I. 13.
Sugar in diabetic urine, origin of .... II. 131.
———, nature of .... II. 135.
Sulphates, alkaline, found in the blood .... II. 372.
Syncope, cases of sudden death from .... I. 157.

T.

Table of the solid contents of various animal fluids .... II. 384.
Tentorium, ossific deposition in .... II. 113.
Tænia, on the use of oil of turpentine in .... II. 24.
Tests of arsenic .... II. 156.
Tests discriminating soda and potash .... II. 357.
Thigh, ununited fracture of .... II. 47.
Thomas, dissection of diseased heart .... I. 41.
———, artificial dilatation of the female urethra .... I. 123.
——— of the rectum .... I. 129.
Thyroid gland, fluid from a tumor in, analysed .... II. 377.
Travers, case of aneurism by anastomosis in the orbit .... II. 1.
Trismus, cases of, successfully treated .... II. 286.
——— .... II. 293.
Tumor in the brain, cases of .... I. 181.
——— .... II. 113.
——— in the female pelvis obstructing delivery .... II. 298.
——— in the thyroid gland, fluid from .... II. 377.
——— in the chest, fluid from .... II. 378.
Turpentine, oil of, used in tænia .... II. 24.

V.

	Vol.	Page
Valves of the heart, disease of	I.	25.
Variolous infection communicated to the fœtus	I.	269.
Venesection employed to counteract the effects of arsenic	II.	153.
——— tried in diabetes	II.	134.
Vieusseux, Dr. case of singular nervous affection	II.	217.

U.

	Vol.	Page
Urea, quantity contained in diabetic urine	II.	124.
Urethra, female, artificial dilatation of	I.	123.
———, description of two muscles of	I.	175.
Urine in diabetes, chemical examination of	II.	119.

W.

	Vol.	Page
Walcheren fever, on the treatment of	II.	192.
Wall, Dr. case of premature puberty in a female	II.	116.
White, case of premature puberty in a boy	I.	276.
Wilson, description of two muscles of the urethra	I.	175.
Wollaston, Dr. analysis of a calculus	II.	210.
Woodd, cases of sudden death	I.	165.
Worms voided from the urethra	II.	385.
Wound of the heart, case of	II.	58.

Y.

	Vol.	Page
Yelloly, Dr. case of tumor in the brain	I.	181.
——— his suggestion of blood-letting to counteract the effects of arsenic	II.	153.
Young, case of strabismus from tumor in the brain	I.	216.
———, case of a fœtus found in the abdomen of a boy	I.	234.

END OF VOL. II.

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